

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF TEXAS
DALLAS DIVISION

PRINTING RESEARCH, INC.,
HOWARD W. DEMOORE and
RONALD M. RENDLEMAN

Plaintiffs,

v.

WILLIAMSON PRINTING
CORPORATION, BILL L. DAVIS and
JESSE S. WILLIAMSON,

Defendants.

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CIVIL ACTION NO. 3-99CV1154-M

DEFENDANTS' RESPONSIVE DESIGNATION OF EXPERTS

Pursuant to paragraph 6 of the Amended Scheduling Order and Rule 26(a)(2), Fed. R. Civ.

P., Defendants designate the following expert witness who will testify at trial:

Bernarr R. Pravel, Esq.
Akin, Gump, Strauss, Hauer & Feld, L.L.P.
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Houston, Texas 77002

Raymond J. Prince
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James E. Taylor
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One copy each of Mr. Pravel's report dated November 16, 2000, Mr. Taylor's report dated November 15, 2000 and Mr. Prince's report dated November 15, 2000 is attached hereto.

CERTIFICATE OF SERVICE

I hereby certify that the foregoing Defendants' Initial Designation of Experts with the attached report of Bernarr R. Pravel was served on Plaintiffs' counsel by hand delivering true and correct copies thereof to the offices of Plaintiffs' counsel on the 5th day of October, 2000, addressed as follows:

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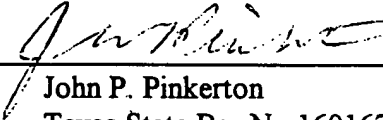


John P. Pinkerton

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Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a true and correct copy of the foregoing Defendants' Responsive Designation of Experts with the attached reports of Bernarr R. Pravel, was mailed by first class United States mail, postage prepaid, on this 17th day of November, 2000, to Plaintiffs' attorneys addressed as follows:

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- 1 -

("NTAC")(in preparation for Texas A&M), now the University of Texas at Arlington, majored in mechanical engineering, and completed a two-year curriculum in engineering. I attended Southern Methodist University for five years from 1958-1963 and have more than 100 hours of credits, making As and Bs and concentrating in math and mechanical engineering. NTAC was only a two year college in the 1940s.

3. I have taken as many educational courses as possible (from junior high school through college - full and part-time - as well as continuing education classes) in drafting, mechanical drawing, mathematics, science, and engineering, with emphasis on mechanical and structural engineering and design. Special courses were also taken relating to hydraulics, pneumatics, fluid dynamics, manufacturing engineering, electrical, and computer technology. My early employment related to structural, machine and controls design. Later it has mostly been applications of low and high viscosity liquids in high-speed industrial machinery for the papermaking and converting industries; and in particular, to the printing industry on commercial sheet and web-fed lithographic offset printing presses, with the Dahlgren group of companies.

4. As my *curriculum vitae* states, I have had a continuous work history for over thirty-six (36) years at Dahlgren Mfg. Co., Dahlgren International Incorporated, Dahlgren U.S. A. Inc. (collectively "Dahlgren"), with extensive experience in the design and development of equipment for the graphic arts industry, primarily to meter and apply both high and low- viscosity inks and coatings to offset printing presses. With education plus experience, I consider myself to have more than an equivalent degree in Mechanical Engineering.

5. As Chief Engineer for Dahlgren Mfg. Co., I assisted Harold Dahlgren, founder, in further developing and commercializing the first continuous-duty dampener for all types of

lithographic press applications. Over the years, since the early sixties, more than one hundred thousand (100,000) such dampening systems have been placed on presses worldwide, with most still running today. All press manufacturers now offer either a Dahlgren dampener, a copy thereof, or similar "Dahlgren type" design as standard equipment, or at least as an option.

6. Dahlgren Mfg. Co. was the first company to offer a simple, highly efficient, multi-roll coating moisturizing or liquid application system ("LAS", below) for use on web applications by the paper-making and paper converting industries. I was responsible for the design and development of this system while I was Chief Engineer and later a Manager of Special Projects and Division Manager of Liquid Application Systems ("LAS") products. Hundreds of these machines were built to apply low-viscosity coatings and liquids to paper and board substrates - to 300 inches wide and to 5,000 feet per minute.

7. Dahlgren Mfg. Co. was also the first company in the world to develop and demonstrate a multi-color true "perfecting" (printing on both sides of the sheet at the same time) offset sheet-fed printing press. This was in the mid 1970's and 1980's. I supervised completion of the engineering design, assembly and testing of the press while I was Manager of Special Projects for Dahlgren.

8. Dahlgren Mfg. Co. was also the first to develop, demonstrate and commercially print with keyless inkers. I was responsible for the design and development of this inking system and was co-inventor on several patents on this system. "Keyless" inking is now being offered by some press manufacturers on special commercial sheet-fed offset printing presses as well as flexographic newspaper applications.

9. Finally, Dahlgren Mfg. Co. was the first company to place a coater inline on a lithographic offset printing press. This was in the early 1970's while I was manager of R&D of Dahlgren Mfg. Co. Now, some 30 years later, coaters have been designed for most all sheet-fed presses and some web presses, from 30" to 80" wide and running more than 1,800 feet per minute.

10. Dahlgren has sold several hundred coaters, most installed on sheet-fed offset lithographic printing presses. Most are placed in-line with printing functions, after printing and over wet ink, and most on existing presses. Virtually every sheet-fed press manufacturer now offers a tower coater, down-stream of printing functions, for applying coating in-line on new offset litho-presses.

11. Dahlgren has more coaters on in-place offset sheet-fed printing presses than all of their half-dozen competitors combined. Most, if not all, Dahlgren coaters are equipped to be retractable away from the press unit area where they normally operate.

12. I first became acquainted with coating in-line on a lithographic press in the mid-70's at Taylor Publishing Company in Dallas where we had an experimental keyless inker on the last unit of a 2-color offset (38" Harris) press. The conventional inker was replaced by our unit.

An infra-red (IR) or radio frequency (RF) dryer was in the delivery of the press. The coating was dried immediately. The inker worked very well and produced a beautiful coating, with high gloss and good scuff resistance, and further with a good cosmetic look and feel. This development eliminated the need for spray powder.

13. Later, in the late 70s to early 80s we placed a similar coater, as was supplied to Taylor Publishing Company, on our 4/C R&D perfecting press. We printed, in-line, three (3)

colors on one side of the sheet on the first three units and coated on the last unit over the wet ink and then immediately dried the ink and coating with an IR dryer and high-velocity air drying system, all developed by Dahlgren. At this time, on the above projects, I was Manager of Research and Development of Dahlgren Mfg. Co. and later became Vice President of R&D and Director of Corporate Technical Development.

14. I set-up a testing and demonstration laboratory in the mid 1980s in R&D to test different types of coaters, each using different coatings and substrates to determine requirements to provide optimum results for coating and drying. Single and two roll coaters were tested.

Anilox roll coaters were tested with both a meter roll and later with a doctor blade as a metering member. The blade was used in both a wiping and a skiving (reverse) angle of attack to the anilox roll. The reverse angle is used in "chambered" doctor blade systems. The coaters in the lab were not retractable. Sketches of coaters with various retraction mechanisms are produced at Tab S18. Don Selby was a design engineer working for me in R&D who designed the different test coaters used in our test lab. Since we were not producing daily production on our 2/C 38" Harris lab/demo press in R&D, the single and two roll coaters installed on this press were not retractable, as previously stated. In order to actually sell units for production to printers, we were asked to begin thinking of "best mode" designs of retraction mechanisms which could be our standard type designs. Therefore Don and I made these sketches for our initial study.

15. Later, in the mid 1980s, we purchased the patent rights to Mark DiRico's horizontal retractable coater, called the "Hub Coater" (U.S. Patent No. 4,685,416) (W019373). Mark was working with the Hub Offset Company with his family who owned Hub Offset in Mansfield, Massachusetts. I helped prosecute the patent to allowance, working closely with

DiRico's patent attorney John Freeman at Fish & Richardson in Boston. A later vertically retracting coater was jointly designed and developed by Mark DiRico and Dahlgren's Phillip Rodriguez (U.S. Patent No. 4,825,804) (W019445), to not only horizontally move the coater, but also vertically move the coater, to a remote position away from the coater's normal position of operation. This allowed the operator complete access to the printing unit when the coater was not in use. The patent was assigned to Dahlgren International. Several hundred DiRico '416 and '804 coating systems with retraction devices have been sold worldwide.

16. In the late 1980s and early 1990s, Dahlgren developed an inclined retractable coater to enable simultaneous printing and in-line coating on the last unit of an offset lithographic press. This enabled printing and coating on a printing unit without sacrificing a printing unit. This development led to the issue of two (2) U.S. patents: Koehler, et al. U.S. Patent Nos. 4,934,305 and 5,178,678 (Tabs P58 and P67 respectively) (W019518 and W019629). Approximately 150-200 such coaters have been sold for use on Heidelberg, MAN-Roland and Mitsubishi presses.

17. During my 36 years at Dahlgren, I either provided original concepts, R&D designs, designs, design adaptations and/or design improvements on the following products for Dahlgren:

(a) Dampering systems for lithographic presses:

- Sheet and web-fed presses (offset & Di-Litho)
- Metal decorator presses
- Board presses
- Forms presses

- Duplicator presses
- Coater/dampener for sheet-fed presses

(b) Coaters:

- Coater/dampener
- Reverse roll
- Silicon (blade)
- Blanket (single anilox roll w/blade and 2 roll)
- Liquid application system (L.A.S.) web
- Spec. off-line coating system

C. Moisturizers (2 and 3 roll):

- LAS - web
- Liquid application of cut sheets

D. Presses:

- Four (4) color simultaneous perfecting offset lithographic presses

E. Inkers:

- Keyless (single roll)
- Commercial and newspaper
- Flexo (coater/printers)

F. Other miscellaneous devices:

- 2nd unit color head (inker/dampener)
- Saturator vacuum dryer
- Oscillating form rolls/self-oscillating rolls

- Dampering fluid evaporation systems
- Hickey picker dampener

I believe the extensive and self-fulfilling work experience mentioned has prepared and provided me with the knowledge, expertise and credibility to be an "expert" in the use of coating and inking systems on printing presses.

II.
THE PRIOR ART TO U.S. PAT. 5,630,363
WITH RESPECT TO ANILOX ROLL INKING/COATING SYSTEMS,
ROLL METERING METHODS AND AUXILIARY RETRACTING SYSTEMS

18. Attached hereto as group Exhibit B are lists of patents and literature that may form part of the prior art to the '363 patent, which I understand is in the process of being reissued. I have an extensive educational and work background relating to the design and development of these systems. The time period for the study presented is 1994 through mid-1995, back to at least the mid-1980s. Anilox rolls associated with their metering devices are discussed. A detailed "matrix", attached as Exhibit C, is provided for various types of retraction devices used with certain coaters and inkers. Each device is coupled to either an issued patent, published brochure or to design sketches by those having ordinary skill in the art of the auxiliary printing equipment.

19. Commercial inking and coating systems as of 1994-1995 consisted largely of one or more rolls rotating at high surface speeds with high centrifugal forces, resulting from small diameters and large revolutions per minute (RPMs). Rolls were normally in contact with adjacent rolls and rotated together at the same or slightly different surface speeds. An inker on an offset press for hi-viscosity liquids may have had as many as twenty or thirty rolls, where in an

application of low-viscosity liquids, from only one to three rolls may suffice. The liquid inks for lithographic offset presses were at that time, and are now considered hi-viscosity (buttery or sticky and stiff). Liquid inks for flexographic presses are fluid, shear readily and are normally relatively thin. Generally, protective and decorative coatings are used on either type of press, whether offset or flexographic, and are considered low-viscosity.

20. To properly apply a desired thickness of ink or coating to a paper or plastic substrate, one is required to use different metering methods for the low and high-viscosity liquids (this study relates primarily with low-viscosity inks and coatings, and particularly to flexographic-type inks, and to coatings for applications on flexo or offset presses). Only one to three roll inkers or coaters are, therefore, referred to in this report.

A.

The prior art with respect to the
'363 patent: Anilox Roll Inking / Coating Systems

21. In 1994-5, as is true today, a single or one roll inker or coater, where the roll used has an engraved surface (with pits or cells holding the liquid), is referred to as an "anilox roll" inker or coater. The word anilox is derived from the word aniline and especially aniline dye (made from aniline, which is an "oily liquid obtained from coal tar and especially from nitro-benzene used in making dyes and perfumes, in certain medicines in plastics, in resins, etc.") and therefore, low-viscosity fluid and fast drying. The quoted reference comes from The World Book Dictionary (Thorndike-Barnhart, Vol. 1 © 1974). Liquid ink or coating was metered in 1994-1995, as it is today, from the engraved surface by either of two (2) methods:

1. (First Metering Method)
With doctor (scraping or shearing) blade or blades

22. Open fountain: A single blade may be used to remove most of the liquid from the surface of a roll by scraping (or wiping) the roll using pressure on the roll at the blade's edge, and placing the blade at a certain angle to a line tangent to the surface, where the edge touches the roll. A single blade may also be used to remove virtually all of the liquid from the roll's surface by shearing liquid at the blade/roll interface by placing the blade at a reverse angle from the wiping angle described above, and using only light pressure to the surface. A reversible blade has some advantages over a wiping blade, especially at high surface speeds. A wiping blade tends to leave some ink or coating on the roll's surface and increases in thickness due to hydroplaning of the blade at high speeds. Whether a wiping or reverse angle blade is used, the fountain or reservoir of liquid created at the blade / roll interface is exposed to ambient air, and is said to be an "open" fountain.

23. Enclosed fountain: An "enclosed" fountain can be obtained by using a *chambered doctor blade* system where two blades are used and spaced apart, one a wiping blade and one a reverse angle blade, forming a chamber therebetween. The chamber is encompassed by these two blades, the surface of the roll and the blade holder itself. End seals are provided at the ends of the roll and seal the coating from leaking. Thus, an "enclosed" cavity or chamber exists, where ink or coating may be circulated to and through the chamber, while a small amount is carried away by the cells engraved into the anilox roll's surface. The wiper (wiping) blade serves to seal one side of the chamber, while the reverse angle (working) blade seals and removes virtually all the liquid from the surface of the roll. Ambient air is therefore prevented from

entering the cavity to cause bubbles, foaming and/or streaks and skips due to cavitation. Air can be brought into the chamber only by empty cells, or from entrained air in the coating being pumped to the chamber inlet. This system is well adapted for high-speed applications as described above and is normally more compact and "user friendly" than an "open" fountain system.

24. Several such "enclosed" (chambered) doctor blade systems are shown and/or described in both U.S. and foreign patents, especially the following items (see group Exhibit B): Patent No. EP 0 293 586 A2 (Tab P40), U.S. Patent No. 4,685,414 (Tab P41), U.S. Patent 4,796,528 (Tab P46), U.S. Patent 4,821,672 (Tab P49), U.S. Patent No. 4,934,305 (Tab P58), Patent GB 22 63 438 A (Tab 62), U.S. Patent No. 5,176,077 (Tab P66), U.S. Patent No. 5,178,678 (Tab P67), U.S. Patent No. 5,209,179 (Tab P69), U.S. Patent No. 5,335,596 (Tab P71) and Patent No. DE 43 11 834 A1 (Tab P72). These patents describe use of such systems in flexographic inking, as well as coating applications on offset lithographic printing presses. Of the eleven (11) patents mentioned, approximately two-thirds are coating applications on offset presses, with the remaining being inking applications on flexographic presses. The issue dates on these patents range from the late 1980s to the mid 1990s, though chambered doctor blade systems used with anilox rolls were already well-known.

2. (Second Metering Method)
With smooth resilient surfaced roll

25. Prior to the use of doctor blades against engraved anilox rolls, a resilient smooth surfaced roll was placed in pressure contact with the anilox roll, and made to rotate at a slower surface speed to remove most of the ink from the roll's surface. Again, the system was described

as an "open" fountain as opposed to "enclosed". "Open" fountains left unwanted ink on the roll's surface which was unacceptable for printing fine screens and was generally cumbersome to use, hard to adjust and difficult to clean. Therefore, doctor blades have replaced metering rolls, almost entirely, to efficiently remove excess ink or coating from engraved anilox roll surfaces. One of ordinary skill in the art would be expected to know about the prior art relative to smooth resilient rolls, as opposed to resilient engraved anilox rolls such as that alluded to in DeMoore et al. Serial No. 08/435,798, discussed below.

26. Several anilox roll applications are shown and described in both U.S. and foreign prior art patents provided herewith, and numbered: U.S. Patent No. 2,333,962 (Tab P3), U.S. Patent No. 3,604,350 (Tab P9), U.S. Patent No. 4,165,688 (Tab P17), U.S. Patent No. 4,308,796 (Tab P20), U.S. Patent No. 4,586,434 (Tab P36), Patent No. EP 0293 586 A2 (Tab P40), U.S. Patent No. 4,685,414 (Tab P41), U.S. Patent No. 4,796,528 (Tab P46), U.S. Patent No. 4,821,672 (Tab P49), U.S. Patent No. 4,825,804 (Tab P50), U.S. Patent No. 4,934,305 (Tab P58), Patent No. GB 2,263 438 A (Tab P62), U.S. Patent No. 5,176,077 (Tab P66), U.S. Patent No. 5,178,678 (Tab P67), U.S. Patent No. 5,209,179 (Tab P69) and U.S. Patent No. 5,335,596 (Tab P71). These patents describe use in flexographic printing as well as coating applications on offset presses. Of the sixteen (16) patents mentioned, approximately 60 percent of them are used on offset presses, with the remainder on flexo presses, with both inking and/or coating applications. Dates on these patents range from the early forties to the mid-nineties.

B.
The prior art with respect to the '363 Patent
Retraction Systems for Inkers and Coaters as of 1994-5

27. Retraction devices and systems for inkers, and especially coaters attached to printing presses, are primarily used to relocate the inker or coater to a remote location from its normal operating position on the press. This allows access to the press, press unit and/or press cylinder, for use in its normal fashion by a press operator. Some semi-fixed systems, or rolls thereof, are removable to also provide access to certain press areas. The earliest of such devices and systems shown date back to the early forties. Major developments, however, were made between 1980 and the early 1990s.

28. Numbered "Prior Art Brochures", including "Early Retraction System Designs and Patents" and "Prior Art Patents" are listed in group Exhibit B. Some are referred to in the matrix of Exhibit C, numbered in chronological order with the prefix "B" for brochure, prefix "S" for sketch and prefix "P" for patents. This matrix is a chart showing retractable liquid application systems; namely, inkers and coaters. The matrix primarily shows whether the applicator in the patented device is used in-line with printing functions or off-line, away from the printing press. The type of press is also shown, plus types of systems providing access to the press during times when the applicator is not being used; i.e., when printing only functions are performed. The matrix further shows where on the press the applicator is being applied, the liquid being used, and other miscellaneous information. Codes are shown to indicate whether the substrate used in the press is a sheet or web, whether the applicator is a single or multiple roll system and what type of retraction device is provided.

29. The retraction column has been highlighted to readily enable one to identify the type of retraction system that is used with a particular prior art brochure, sketch or patent. The following is a general description of each retraction code shown in the matrix of Exhibit 3.

30. **Type "I" (Inclined)**. This type of retraction provides for direction and force to move the applicator up an inclined plane, up and away, from where the applicator is located in its normal operating position. The force can come from one (1) of several mechanisms; i.e. electric or hydraulic winch, jack-screw, ball nut, hydraulic cylinder, rack and pinion and the like. Some inclines are at about 30 degree angles, some 45 degrees and others at even 60 degrees. In most cases, the movement is far enough away from its working position to allow an operator complete access to the area where he must work from time to time; such as when the press is down, or when the press is used without the applicator.

31. The earliest date of use for this type of retraction shown is seen to be in the mid-1980s. These are numbered: IBC (Tab B3), U.S. Patent No. 4,617,865 (Tab P38), Oxy-Dry (Tab B6), Dahlgren-LPC (Tabs B10, 11), U.S. Patent No. 4,934,305 (Tab P58), EpicBC (Tab B12), U.S. Patent No. 5,107,790 (Tab P64), U.S. Patent No. 5,178,678 (Tab P67), System Designs (Tab S18) and Rapidac (Tab B8). Historically, most of these devices were used on offset sheet-fed presses, with blanket or impression cylinder coaters after the last printing unit. Several hundred of such coater retraction systems are still in use in the United States and are still marketed by several different manufacturers.

32. **Type "H" (Horizontal)**. This type of retraction provides for direction to allow the applicator to move substantially horizontal away from where the applicator is located in its normal operating position. The force required is normally minimal and usually an operator can

move the coater manually. In most cases, the movement is far enough away from its working position to allow an operator access to the area where he must work from time to time; such as when the press is down, or when the press is used without the applicator.

33. The earliest date of use for this type of retraction shown is seen to be in the early seventies and gained popularity in the eighties and nineties. Type "H" is commercial and is sometimes referred to as the "DiRico Type" or the "Hub Type." These are numbered: U.S. Patent No. 3,604,350 (Tab P9), Dahlgren CP (Tab B4), U.S. Patent No. 4,685,414 (Tab P41), U.S. Patent No. 5,107,790 (Tab P64) and Dahlgren BC (Tabs B5,7,9). Historically, most of these devices were used on offset sheet-fed presses with blanket coaters after the last printing unit. Another use is on a flexographic press using flexo inks. Several hundred of such coater retraction systems are still in use and are still being marketed by one or more manufacturers.

34. Type "V" (Vertical). This type of retraction provides for direction and force to move the applicator substantially vertical, away from where the applicator is located in its normal operating position. The force required is often substantial, to lift the applicator nearly straight up for several feet. Here again, like the inclined retraction, the force can come from one of the several types listed for the inclined device; or, maybe as simple as a chain hoist, either electrically or manually operated. In most cases, the movement is far enough away from its normal position to allow an operator complete access to the area where he must work from time to time; such as when the press is down, or when the press is used without the applicator. The earliest date of use for this type of retraction shown is seen to be in the early nineties. The only one shown is numbered as IVT (Tab B15). This device is used on offset sheet-fed presses with

blanket coaters on the last printing unit. The design, though practical, is not as popular as the inclined or horizontal retraction device.

35. Type "F" ("Ferris"). This type of retraction provides for pivotal movement of arms supporting the applicator and force (torque) to move the arms through several degrees of rotation about a fixed pivot, at one end of the arms. The applicator, supported on opposite ends by the arms, moves up and away from its normal operating position. In most cases, the movement is far enough away from its normal working position to allow an operator complete access to the area where one must work from time to time; such as when the press is down, or when the press is used without the applicator.

36. Although desirable, but not absolutely necessary, the applicator should maintain or substantially maintain its normal position (i.e., not rotate) relative to the press. Therefore, it becomes desirable that the applicator be pivotally attached to the opposite end of the rotatable arms to maintain its normal horizontal position relative to the press. This ensures that the applicator remains substantially horizontal as it also swings about the fixed pivots, usually attached somewhere on the press. When the rotatable arms allows the applicator to remain substantially horizontal, the movement is sometimes called "Ferris" like a "Ferris Wheel" at the fair. A "Ferris Wheel" is described in The World Book Dictionary (Thorndike-Barnhart) © 1974, pg. 773, as "a large, revolving wheel with seats hanging from its rim, used in carnivals, amusement parks, etc. (American English, George W.G. Ferris, 1859-1896, an American Engineer, The Inventor.)".

37. The earliest date of use for this type of retraction shown is seen to be in the mid-to late eighties. These shown are numbered as: U.S. Patent No. 4,889,051 (Tab P55) and

Systems Designs (Tab S18). I considered building such a "ferris wheel" coater in the early 1980s. This device is used on offset sheet-fed presses with blanket inkers or blanket coaters. U.S. Patent No. 4,889,051 (Tab P55) shows an application wherein the applicator to be retracted is simply moved on top of the printing unit to which it applies liquid. Also, U.S. Patent No. 4,889,051 (Tab P55) shows application where the applicator can apply ink to select cylinders in the press; that is, at two (2) different levels of a press unit. The DiRico et al. U.S. Patent No. 4,685,414 (Tab P41, col. 1, lines 38-43) and the Koehler et al. patents, U.S. Patent No. 4,934,305 (Tab P48, col. 1, lines 46-52) and U.S. Patent No. 5,178,678 (Tab P57, col. 1, lines 52-58) all reference a "pivoting arm" coater by Norton Burdett Co. of Nashua, N.H. DiRico is known to have improved the Burdett coater to eliminating the "bumping" and streaking problem by the mid-1980s.

38. **Type "T" (Transverse)**. This type of retraction provides for direction to allow the applicator to move not only horizontal, but also transversely across the press, to one side of the press. Normally the applicator simply rolls onto an awaiting cart where it can be moved completely away from the press. Like the horizontal retraction, only a small force is required to move the applicator.

39. The earliest date of this type of retraction shown is seen to be in the late 1980s. The only one shown is numbered as U.S. Patent No. 4,779,557 (Tab P45). This device is used with offset sheet-fed press blanket coaters on the last press unit. The design does not have the popularity as some of the others.

40. **Type "FB" (Four (4) Bar-Linkage)**. This type of retraction has two (2) rotatable, usually identical, parallel bars (arms) which pivot and rotate from fixed pivot points

located on both sides of the press. The opposite ends of the bars are pivotally attached to the applicator. The pivots, and therefore bars, are substantially spaced several inches from each other. The press and the applicator frames actually become the third and fourth bars respectively -- hence, a "four (4) bar linkage." The rotatable bars are normally substantially horizontal, until rotated to a nearly vertical position. This rotation lifts the applicator and allows it to move up and away from its normal operating position. An advantage of a "four bar linkage" device is the rigidity of the arms supporting the carriage. Like the other retraction devices described above, in most cases the rotation carries the applicator far enough away from its normal working position to allow an operator complete access to the area where he must work from time to time; such as when the press is down, or when the press is used without the applicator.

41. The earliest dates of use of this type of retraction shown is seen to be in the mid-eighties. The ones shown are numbered as: Systems Design (Tab S18) and Rapidac (Tab B8). This device is used on offset sheet-fed presses with blanket coaters after the last printing unit. Several such designs are in use today and may be offered by more than one (1) manufacturer. Rapidac is known to have sold a number of Type "FB" coaters.

42. Type "X/Y" (Combination). The slash mark between the X & Y indicates the combination of two different retractions; **I/H** indicates the combination of two different devices, inclined retraction and the horizontal retraction types; **H/V**, the combination of the horizontal and vertical; **I/V**, the combination of inclined and vertical, and so forth. The first letter generally indicates the first movement away from the normal working position of the applicator head, relative to the press. Here again, the combination of retraction movements carries the applicator head far enough away from its working position to allow an operator complete access to the area

where he must work from time to time; such as when the press is down, or when the press is used without the applicator.

43. The earliest date of use for these types of "X/Y" retractions shown is seen to be in the late eighties. The several types shown are numbered as follows:

I/H - U.S. Patent No. 4,841,903 (Tab P51), U.S. Patent No. 4,796,556 (Tab P47), and PRI (Tab B13)

H/V - U.S. Patent No. 4,825,804 (Tab P50)

I/V - U.S. Patent No. 5,209,179 (Tab P69)

V/H - Systems Designs (Tab S18)

H/I - IVT (Tab B15)

Most of these combination type retraction devices were used on offset sheet-fed presses with blanket and/or plate coaters on the last printing unit. Like the inclined and horizontal retraction devices, I believe several hundred of the *combination systems* are in use today and are offered by one or more manufacturers.

44. All the above retraction systems perform basically the same functions: to remove the applicator head to a remote location away from its normal working position on the press, and to allow the pressman safe access to his normal working area, when necessary. After retraction, it is very important that all the applicator heads return to their exact original position, relative to the roll or cylinder to which they were originally set. Therefore, it is most important that the retraction devices, as well as the coatings or inkers being retracted are designed to be as rigid and stout as possible to withstand the high shock forces imposed upon them at high press speeds, often reaching 15,000 impressions per hour.

45. I read Davis and Williamson's Memorandum Concerning the Prior Art and Position on Patentability ("Memorandum") (W014812 A-AA) to the U.S. Patent and Trademark Office submitted on April 7, 2000. The text concerning retraction systems mentioned in the Memorandum (pp. 6-9) was, if anything, understated (see paragraph 28-44 above). In hindsight, I would have added mention of the Satterwhite patent, U.S. Patent 4,308,796 (W019183-W019192). Satterwhite teaches the retraction of an auxiliary unit to engage the blanket cylinder. Nowhere does it teach, let alone mandate, interstation construction of such a unit. One skilled in the art of the 1980s, upon reading Satterwhite '796, would not have interpreted it as an interstation teaching.

III.
QUESTIONS ASKED ME

46. I have been asked the following questions:

(a) What was the state of the art from May, 1992 - June, 1994 with respect to:

- (1) Retractable coaters?
- (2) Anilox rollers?
- (3) Chambered doctors?

(b) Did WPC provide sufficient information to PRI in mid June, 1994 (Baker, Baker Supp., Bird, Bird Suppl., Bird 2d Suppl. Declarations) for a person of ordinary skill in the art of making auxiliary printing equipment to make an interstation flexo unit for use in the flexo/litho process of the '363 patent? If not, was it sufficient by the end of 1994 after transmission of additional information to Bird (See Bird Suppl. Ded., ¶¶ 3-5)?

(c) With respect to PRI's developmental drawings of interstation printer/coater options:

- (1) linear rack back (disclosed in their drawing of 12/5/94), and
- (2) cantilevered device (12/5/94 and 12/30/94)

were these drawings, alone, sufficient to teach one of ordinary skill at that time of the '363 process? If not, did any of the December PRI drawings do so, alone or in combination?

(d) Does application Serial No. 08/435,798, as filed, enable one of ordinary skill to practice the '363 process?

(e) Did Bill Davis and Jesse Williamson have a conception in June 1992 - which I understand is a concept so complete and well defined that it could be reduced to practice when told to one of ordinary skill in the art and without undue experimentation?

(f) Did the concept of Davis and Williamson as described by them to Bowyer in 1992 and subsequently to Baker and Bird in 1994 embrace the retractable flexo unit shown in Fig. 2 of the '363 patent?

(g) Do any of the claims of Serial No. 08/435,798 as originally filed, cover Davis and Williamson's process?

(h) Do any of the claims of Serial No. 08/435,798 as originally filed, cover the device of Fig. 2 of the '363 patent?

(i) Do any of the claims of Serial No. 08/435,798 as those claims exist now before the PTO cover the Davis and Williamson process?

(j) Do any of the pending claims of Serial No. 08/435,798 cover the apparatus of Fig. 2? If so, are those claims within the prior art?

(k) Was PRI's development of the cantilevered or ferris wheel interstation device in 1994-1995 reasonable? Was the cost of development justified?

(l) Was the EZI device actually installed at Williamson an advance in the art?

(m) Is the subject matter of any of the allowed claims of Serial No. 08/435,798 beyond the level of skill in the art as of May 1995?

47. With respect to question (a), I conclude that a variety of retractable coaters existed in the art as of mid-1994, readily adaptable to use anilox rollers and chambered doctors, and capable of being easily modified for so-called "interstation" or "use up front" as contemplated by the '363 patent. With respect to question (b), it is my considered opinion that, based on the facts disclosed in the two declarations of Baker and the information transmitted from Jesse Williamson and Bill Davis to Baker on June 12, 1994 and the facts disclosed in three declarations of Bird, all submitted to the U.S. Patent and Trademark Office in the prosecution of Serial No. 09/315,796, the reissue application to U.S. Patent 5,630,363, that one of ordinary skill in the art could have readily constructed a retractable printer/coater with an anilox roller and chambered doctor for interstation use in the summer or fall of 1994 without undue experimentation, and that the information given to Baker was sufficient to instruct the average person skilled in the art what to do to arrive at a device to perform the flexographic lithographic process of the '363 patent. With respect to question (c), I believe that the December drawings of PRI dated (1) 12/5/94 with respect to a linear auxiliary coater (e.g., production Nos. PRI00005, PRI01139-1140), or earlier, and (2) 12/30/94 (e.g., production Nos. PRI000006 or PRI01137) were insufficient to teach one of ordinary skill in the art the '363 process. Concerning question (d), for a multitude of reasons, I believe that the May 4, 1995 application of DeMoore, Serial No.

08/435,798 fails to adequately teach one of ordinary skill to perform the process. The answer to question (e) in my opinion is yes. According to their testimony (37 CFR § 1.131 Declaration Testimony) and the Testimony of Harry Bowyer, Davis and Williamson had at least three designs in mind to accomplish their process. They preferred use of an auxiliary, retractable flexo printer/coater with an anilox roller and a chambered doctor. The later declaration of Jesse Williamson is also pertinent. The answer to (f) is yes. Davis and Williamson had a workable design concept in 1992 of several devices to practice their process, including a retractable auxiliary unit having an anilox roller and chambered doctor. The answer to question (g) is no.

Claim 24 - 35 are method claims. Claim 24, at best, would have flexographic steps performed at each station. Claim 30 of the original application, the other independent claim, is directed to a process having only two lithographic units, and cannot be described as directed to that type of process which can fairly be described as a continuous in-line lithographic process. Moreover, the claim is inconsistent because it requires the same process sub-steps to be performed at each of the two stations. Claim 30 cannot be fairly characterized as Davis/Williamson's process. The answer to question (h) appears to be yes. At least claims 1 and 13 cover the device of Fig. 2 of the '363 patent. No blade or reservoir is shown in Fig. 2 of the '363 patent as is mentioned in

Claim 12. The answer to question (i) is no. The status of the claims of Serial No. 08/435,798 as of the summer of 2000 is given, as I understand, as Exhibit D hereto. Claims 24-35 stand withdrawn. Claims 6, 9, 18-19 and 21 are allowed and 1-5, 7, 8, 10-17, 20, 22 and 23 are rejected. There are no pending process claims. The answer to question (j) is yes. Claims 1 and 13, both of which stand rejected as being obvious, cover the device of Fig. 2. Claim 12 is also rejected, although as stated above, Fig. 2 does not show a blade or reservoir. I agree with the

examiner that the subject matter of Claims 1, 12 and 13 are obvious in view of Bird U.S. Patent No. 4,841,903, taken in view of Sarda, U.S. Patent No. 4,889,051. The statement made by applicants in their appeal brief (pg. 7, para. 2, lines 5-15) that Sarda "adds no ink" and "does not suggest the application of ink" to the blanket cylinder 3, is simply not true. Also, that "Sarda does not suggest or disclose the potential of a ferris movement inking/coating apparatus directly to the blanket cylinder in a tower to which the apparatus is mounted" is not true. (See claims 3-6 of Sarda which describe position to apply ink to the press blanket cylinder 3, Fig. 4 and the abstract of the Sarda patent). Applicants' statement, again, is not true pertaining to the rejection of Claim 17 (pg. 9, para. 4) regarding Sarda. The blanket cylinder is directly inked by Sarda's device, and it does maintain relatively constant orientation to the horizontal during movement.

I believe that other prior art could have been substituted for either of these two references. I note that none of claims 1, 12 or 13 have an anilox roller, chambered doctor, or [photopolymer] flexographic plate requirement(s), or even a requirement for laying down a flexographic ink or even a requirement that the ink to be applied has an aqueous base. The answer to question (k) is no. The development was unreasonable as to length of time and expense. Quite frankly, it was the work of an organization making an auxiliary "rack-back" apparently for the first time. No competent organization would have built an experimental cantilevered device such as PRI did for WPC at the end of February 1995 and used WPC as a guinea pig for simulations. The answer to (l) is no. Each of the EZI devices actually installed by PRI that I observed at WPC were not on par with the state of the art in auxiliary equipment manufacturing. The diameter of the anilox roll was too small. Second, the auxiliary mechanisms had no state of the art device to prevent bouncing. The retraction arms and coating head were made out of aluminum, which does not

provide sufficient strength and rigidity for this application. The wall thickness of the anilox roll was far too thin. The entire auxiliary device was flimsy. PRI's Steve Garner knew in 1995-1996 that the WPC device had bouncing problems and needed to be latched and locked, but Dahlgren, to the best of my knowledge, was never approached by PRI to obtain a license for Dahlgren's state of the art latch and lock technology. The answer to (m) is no. The few allowed claims 6, 9, 18-19 and 21 involve some "bells and whistles" (e.g., "power actuator", claim 6, 21; "stop member", claim 6,21; "clevis plate", claim 6, 21; "motor means", claim 9; "first cradle", claim 18; "carriage assembly" with a "pivoting inking coating apparatus", claim 19; and "bell crank", claim 21), all of which were old in the art and all of which would have been obvious for the person of ordinary skill to install on a basic device to perform the '363 process.

Several things also strike me. The length of time between the time agreed upon to make an interstation device – about February 11, 1995 (PRI 00134, W0004259) and the first installation sometime between late August 1995 (37 C.F.R. §1.131 Declaration), as maintained by WPC, and November 1995 (Complaint), as contended by PRI, is simply unreasonably long. Three months was sufficient -- five to six weeks in engineering and eight weeks in manufacturing would be sufficient. The device would have then been installed in a week or two weeks.

Moreover, the costs which PRI asserts that it spent on developing the device in 1995 – \$469,109.74 (DeMoore Exhibit 17, PRI 00345) – is unreasonably high, indicating to me that they want now to be reimbursed for their research and development, engineering, administrative and capital costs in entering the auxiliary "rack-back" field. Dahlgren in 1995 would have sold three units to WPC for a maximum of about \$75,000 each -- all delivered and installed at that price, fully guaranteed to run at press speeds. We would have made a reasonable profit. PRI, in fact,

priced their unit at \$62,084 in February 1995 (W00426). DeMoore's Exhibit 17, with a rough estimate of costs supposedly attributable to development of the EZI, does not comply with industry standards concerning allocation of labor costs for employees. There is no information provided, employee by employee, for each work order number on a number by number basis, let alone day-by-day. Furthermore, I understand, based on Jesse Williamson's testimony, that no manuals were provided to WPC with the EZIs. This was a deficiency of PRI's because it is common practice in the printing equipment industry to furnish operations manuals with the equipment providing instructions on installation, adjustment, operation and maintenance of the equipment.

There is no indication in the testimony of Rendleman or DeMoore that PRI ever approached Dahlgren for a patent license to anything. I know from personal knowledge from speaking to Steve Garner at the time that PRI feared Dahlgren's patent coverage concerning critical aspects of its "rack-back" coaters and I believe that the reason for PRI having gone in the "ferris wheel" direction was not out of design creativity, but out of fear of confronting so-called patent problems with Dahlgren. In reading the DeMoore and Rendleman depositions, I walk away from them with the notion that their testimony is such that the "ferris wheel" approach was selected due to vertical space limitations. Yet I find no testimony whatsoever on the part of DeMoore and Rendleman that ceiling height was ever given as a mandatory constraint. Most importantly, I find no evidence that DeMoore, Rendleman or anyone else at PRI ever counseled the client as to the best approach to work Davis' and Williamson's contemplated retractable design so as to minimize costs, time of installation and workability of the device at normal press speeds. In my opinion, from the DeMoore and Rendleman testimony and from PRI's drawings

(Bucket "A"), PRI was driven to select a cantilevered mechanism in order to try to secure patent rights and avoid possibly conflicting patents, rather than select the best design for the job. The "ferris wheel" "F" concept, however, is old, and is simply not the best, for a variety of engineering reasons. Unless adequately latched and locked, it is prone to have "bouncing" and to cause a decrease in productivity. A type "I" or "V" or "H", or a combination thereof, have been long proven to be the best.

48. In reaching the conclusions set forth herein, I have reviewed:

<u>Bucket</u>	<u>Descriptions</u>	<u>Bates Nos.</u>
A	PRI's Drawings;	See Exhibit G
B	U.S. Patent No. 5,370,976 to Williamson, et al.; U.S. Patent No. 5,630,363 to Davis, et al.;	PRI01055-PRI01062, W000010-W000017
C	U.S. Patent No. 5,638,752 to Hartung, et al. and 5,476,042 to Ehrhard et al.;	W012899-W012913
D	Declarations - master List (all declarations submitted in reissue application, including those of reissue applicants and Ray Prince, and third party witnesses Baker, Bird, Garner and Brown, etc.);	W012914-W013389
E	Paper submitted October 13, 2000 to PTO entitled REISSUE APPLICANTS FIRST SUBMISSION OF DEPOSITION TESTIMONY AND SUBMISSION OF SUPPLEMENTAL DECLARATION, including Depositions of Baker, Bird, Brown and Garner and exhibits and recent (October 5, 2000) Supplemental Declarations of Baker and Bird; and recently submitted expert reports of Pravel and Professor Mott;	W013390-W014323
F	Pleadings by the parties in this case, including proposed counterclaims of Defendants;	W014325-W014398
G	Plaintiffs' and Defendants' responses to interrogatories, requests for admissions and document requests;	W014399-W014496
H	The expert reports of Pravel and Professor Mott as tabbed in "E" above;	W014497-W014526

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<u>Bucket</u>	<u>Descriptions</u>	<u>Bates Nos.</u>
I	Various copies of Serial No. 08/435,798, as filed May 5, 1995 and a counterpart EP0741025(A3);	W01349-W01409; W014527-W014595
J	U.S. Patent No. 5,598,777, U.S. Patent No. 5,651,777, U.S. Patent No. 5,960,713 (Ray Prince studied this in detail and testified about the '713 in the PTO); U.S. Patent No. 6,116,158;	W014596-W014699
K	Original Reissue Application as filed 5-20-99, including original cut-up specification and proposed claims;	W014701-W014768
L	PTO Protest of DeMoore, et al., in PTO reissue, September 1999;	W014769-W014771
M	First Office Action in PTO reissue mailed February 9, 2000;	W014772-W014786
N	Amended and Cut-up Specification and Reissue Applicants' Position on Patentability with Attached Declarations of Baker, Bird, Brown, Bird supplement, and Garner filed April 7, 2000;	W014787-W015270
O	Supplemental amendment filed July 7, 2000 in the reissue application;	W015271-W015475
P	First supplemental statement of prior art and other information filed May 20, 1999 (original set of prior art);	W015476-W015801
Q	Second supplemental statement of prior art and other information filed July 17, 2000 (art not previously included and mentioned in Item "N" above and abroad and in Serial No. 08/435,798;	W015802-W016603
R	Third supplemental statement of prior art and other information filed September 26, 2000 (the Hartung, et al. patent Item "C" above and Declaration including Ray Prince's Third Supplemental Declaration);	W016604-W016616
S	Fourth supplemental statement of prior art and other information filed September 29, 2000 (including Canadian brochure and Ray Prince's Fourth Supplemental Declaration);	W016617-W017040
T	Deposition of Bill Davis (not concluded);	W017041-W017230 and exhibits of other numbered series

<u>Bucket</u>	<u>Descriptions</u>	<u>Bates Nos.</u>
U	Deposition of Ron Rendleman (not concluded);	W017231-W017552 and exhibits of other numbered series
V	Deposition of Jesse Williamson (not concluded);	W017553-W017775 and exhibits of other numbered series
W	Deposition of Howard DeMoore (not concluded);	W017776-W018097 and exhibits of other numbered series
X	File History EP 620,115 (counterpart to U.S. Patent 5,638,752) and English translations of European applications; KVA Opposition and decision and prior art K1-K7 cited by Opponents	W018098-W018865
Y	Prior Art to Exhibit 2	W018867-W019721
Z	Selected portions of File History, U.S. Patent 5,960,713	W02038-W02663
AA	File History, Serial No. 08/435,798	W01670-W02034

III. ANALYSIS

49. I have prepared a set of drawings, copies of which are attached as Exhibit E, showing conceptually prior art retractable and manual coating devices adapted for interstation use.

50. Had I been given the task of constructing a retractable coater to meet in June, 1994 the Williamson-Davis design criteria indicated in the Baker ((a) W013251-13255 and (b) W013256-W013262) and Bird ((a) W000876-W000879, W013166-W013190, (b) W013193, and (c) W013246) declarations submitted to the U.S. Patent and Trademark Office and the deposition testimony of Davis and Williamson, I would have preferred an inclined version

(Type "I"). This design, in my opinion, avoids the potential problem of "bumping" and streaking inherent in the ferris wheel concept, even at low and especially at high press speeds.

51. To the best of my knowledge, PRI was to all practical purposes a novice with respect to the design and construction of coater devices in mid-1994. The "EZ" coater was a commercial failure, as virtually admitted by DeMoore in his deposition, and the "EZB" coater obtained from Bird was designed and manufactured outside of PRI.

52. Based on the deposition testimony and/or declarations of Jesse Williamson ((a) W012997-W013047 and (b) W013263-W013286), Bill Davis (W012997-W013047), Gary Doughty (W013312-W013328) and Harry Bowyer (W013287-W013311), it is clear to me that Bill Davis and Jesse Williamson had a workable conception of the process of the '363 upon Williamson's return from Germany in late May, 1992.

53. Once an indication was given to one in the auxiliary printing equipment business, such as to Baker of PRI on June 12, 1994, that an interstation, retractable printer/coater was desired having an anilox roller and chambered doctor, little other instruction was necessary. The information provided by Davis and Williamson starting in August 1994 (see Bird Supp. Decl., W013193-W013245, ¶¶ 3-4 at W013194) related primarily to the process and was not essential to make the equipment requested. Having studied the prior art -- including that mentioned in the various submissions by Davis and Williamson to the Patent and Trademark Office (buckets P and Q), the submissions in Serial No. 08/435,798 (file history Tab AA) and the other known art (bucket Z), in my opinion, the process approach of Davis and Williamson was revolutionary in the mid-1990s. I have personally seen the results of this approach, and they are spectacular. A continuous in-line process, if executed well, maximizes speed and minimizes cost, also.

54. The drawings of PRI in December 1994 (note bucket "A") taken alone do not teach one of ordinary skill the Davis/Williamson flexo-litho process, much less the advantages.

55. Application Serial No. 08/435,798 filed May 4, 1995 (bucket "I", or W01349-W01412 or W014527-14579) did not at that time enable one of ordinary skill in the art to make a workable device consistent with its teachings, let alone enable the '363 process. The substance of the earlier WIMS '976 patent is not taught or incorporated by reference. With respect to the "ferris wheel" device, no adequate teaching is included of how a "resilient" anilox roller is made - - something that I understand in the '713 prosecution lead to a first office action rejection, if not a October 28, 1997 final rejection on claims having that term in Serial No. 08/538,422 leading to U.S. Patent 5,960,713 (W014641-W014669), for which, DeMoore had to amend his specification (col. 16, lines 17-41 of the '713 patent W014665), in August, 1998 to cure. From one of my own patent applications filed in 1996, I know as a practical matter that one of ordinary skill in the art did not know what that term meant in 1995. Most importantly, the teaching of interchangeability of a "resilient" anilox roller and a standard anilox roller for interchangeable printing or coating on p. 13 (W0013690 - W014542), lines 14-17 of Serial No. 08/435,798, is inoperable (standard anilox roller could not properly engage the plate and one could not properly "coat" from the plate cylinder). One cannot interchange a steel anilox roller with a "resilient" anilox roller for engaging a thin, relatively hard plate on a plate cylinder. The dual head, "double bump" concept alluded to in Fig. 6 (missing from Serial No. 08/435,798 as filed, but present in EP 741,025 A3 (W014590-14595)) is, as described in Serial No. 08/435,798, in my opinion, unworkable.

56. The teaching of the '363 patent incorporating by reference WIMS '976, together with Fig. 2, is adequate to teach an interstation device and the '363 process. In a nutshell, the

concept of Davis and Williamson as described in their conversation to Bowyer in October 1992 in Dallas and as conveyed to Baker of PRI in June 1994 and to Bird of PRI starting in August 1994 encompasses the retractable flexographic coater as shown in Fig. 2 of the '363 patent.

57. I have also been asked if the claims of U.S. Patent 5,960,713 (W014667-W014669) or any of them are taught in Serial No. 08/435,798. The answer is no -- clearly no. The concepts of a retractable auxiliary unit, i.e., "ferris wheel", and a dedicated station are different. The figures are different. The only thing that ever could have been in common was the "double bump" concept, but Serial No. 08/435,798 did not teach adequately what a resilient anilox roller was, and Fig. 6 was omitted in Serial No. 08/435,798 as filed, but included in the European counterpart.

58. Reading the deposition testimony of Davis, Rendleman, Williamson and DeMoore, it is clear that the first EZI devices made by PRI were made for Williamson. There is no testimony in the depositions that PRI ever promoted the "dual cradle" or "double bump" technology to WPC. The fact that none of these were promoted or built with the "dual cradle" arrangement for WPC speaks volumes to me. If PRI was in command of a workable "double bump" technology, they would have wanted to install it at WPC, and use WPC for advertising purposes.

59. The opinions given herein are based solely on the testimony and other documents in paragraph 12 above, and the undersigned reserves the right to change, to alter, or to enhance his testimony upon the review of additional testimony or other documents.

60. I have reviewed among other depositions, the first part of Rendleman's deposition. There are inaccuracies in Rendleman's Testimony as follows:

- (a) Rendleman did not work for me at Dahlgren.

(b) Rendleman knew our coater retracted more than 1". It actuated "on/off" to blanket 1" but retracted as much as 1 to 3 feet horizontally.

(c) Rendleman didn't design an inker for Dahlgren except for a single R&D project on a perfecting press which never materialized into a production (saleable) item.

(d) Except for the press project (c) above, Rendleman was in manufacturing, maintenance and assembly areas during his Dahlgren tenure.

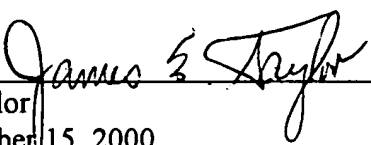
(e) Rendleman had to know about the DiRico patented coater and the DiRico, et al. patented coater retractable mechanisms before Rendleman left Dahlgren.

IV. OTHER ITEMS

61. This is the first time I have testified as an expert in a printing case. I am recently retired from Dahlgren. I have one publication: "Cost and Quality, A Dampener Dilemma?", attached hereto as Exhibit F. There are twelve patents issued by the U.S. Patent and Trademark Office on which I am the inventor or coinventor:

	<u>Patent Number</u>	<u>Name</u>
(a)	4,373,442	Portable Ink Fountain
(b)	4,442,139	Dampering Fluid Evaporator & Method
(c)	4,444,147	Coating Apparatus
(d)	4,453,463	Inking Systems
(e)	4,527,471	Dampering Fluid Removal Device
(f)	4,527,479	Ink Removal Circulating & Distribution System
(g)	4,532,735	Variable Angle Extruder Blade Surfacing Machine
(h)	4,533,563	Coating Method

- | | | |
|-----|-----------|--|
| (i) | 4,934,305 | Retractable Coater Assembly Including a Coating Blanket Cylinder |
| (j) | 5,178,678 | Retractable Coater Assembly Including a Coating Blanket Cylinder |
| (k) | 5,797,318 | Liquid Applicator for Cut Sheets |
| (l) | 5,908,505 | High Volume Textured Liquid Transfer Surface (abstract attached) |



James E. Taylor
Date: November 15, 2000

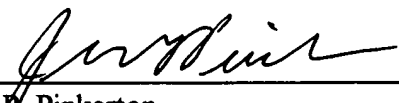
0934305 05178678 05797318 05908505

CERTIFICATE OF SERVICE

I hereby certify that the foregoing Expert Report of James E. Taylor Under Federal Rule 26(a)(2)(b) was served on Plaintiffs' counsel by placing a true and correct copy thereof in the United States Mail, postage prepaid, on the 17th day of November, 2000, addressed as follows:

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I was employed by Dahlgren USA, Inc., and its predecessors, for over thirty six (36) years during which time I had upper management responsibilities in Engineering, Research and Development, and Technical Sales. I served with Dahlgren Manufacturing from 1963-1984, Dahlgren International, Inc. from 1984-1989 and Dahlgren USA, Inc. from 1989-2000. I retired from Dahlgren USA, Inc. effective as of January 1, 2000. I am now retained on a part-time basis by Dahlgren USA, Inc. as a technical consultant primarily to complete an ongoing project concerning: off-line applications of low-viscosity liquids.

JOB EXPERIENCE:

Responsible for Dahlgren's entire patent and licensing program on all corporate products and involved in developmental design, testing and evaluation of Dahlgren's new products. Served as technical consultant and advisor to upper management relative to old and new products pertaining to the companies' business as a supplier of quality industrial machinery and equipment to the Graphic Arts Industry, worldwide. Reported directly to the President, Chairman of the Board and owner of Dahlgren Mfg. Co., Dahlgren International, Inc. and Dahlgren USA, Inc.

Provided technical support to Dahlgren's affiliates (Japan, Germany, United Kingdom, Canada, etc...) for technical inquiries pertaining to incoming sales (esp. to Japan). Coordinated with Dahlgren's USA's Engineering and Manufacturing Departments to establish schedules to meet customer requirements. Intimate knowledge was required of all Dahlgren's Products and interworkings of the company with ability to communicate within the structure of the entire organization as related to worldwide activities of Dahlgren International, Inc.

Provided technical material for publication of all Dahlgren's Product Data Bulletins as well as product brochures.

Served on Dahlgren's Board of Directors for eight (8) years from 1974 to 1982.

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During the first six (6) years at Dahlgren, I served as Chief Engineer with primary design engineering management responsibilities on sheet and web-offset press Dampening and Web Conditioning Systems; also Dahlgren's Liquid Application System (L.A.S.), for high-speed paper making and paper converting machinery. Was responsible for fit and function of the original Dahlgren Dampener Product as it was initially applied first for domestic use and then world-wide on new and used sheet and web-offset printing presses, regardless of size, age, speed, or manufacturer. All specifications for production design were originally set-up by me and /or under my supervision.

For the L.A.S. product, was responsible for Sales, Service and Engineering during the early development of this product and for approximately the first thirty (30) machines. The largest unit build to date (240 inches) was developed, sold and applied under my supervision. Served as special technical assistant to the founder of Dahlgren Mfg. Co. for several years. Product involvement has been on the following Dahlgren developments/products:

DAMPENERS: Sheet and Web-Fed Presses (Offset and Di-Litho)
Metal Decorator Presses
Board Presses
Forms Presses
Duplicator Presses
Coater/Dampener for Sheet Presses

COATERS: Coater/Dampener
Reverse Roll
Silicon (Blade)
Blanket (Single Anilox Roll W/Blade and 2 Roll)
L.A.S.
Special Off-Line Coating System

MOISTURIZERS AND DECURLERS: L.A.S.
Web Conditioner

PRESSES: Hustler (4-Color Perfector)

INKERS: (Keyless) Single Form Roll
Commercial
Newspaper (Offset, Di-Litho, Flexographic)

OTHER: Duplicator, 2nd Unit Color-Head (Inker/Dampener)
Saturator/Vacuum Dryer
Oscillating Form Rolls/Self-Oscillating Rolls
Dryers (I.R.)
Dampening Fluid Evaporation Systems
Hickey-Picker
Skeleton Wheel

James E. Taylor

Have served in the following capacities for the past 36 + years:
Chief Engineer, Division Manager, Manager of Special Projects,
Manager of Research and Development, Director - Corporate
Technical Development, and Vice President - Research and
Development, Sales Administration and Technical Sales Manager.

Well over 125 patents (domestic and foreign) representing over 50
inventions, have been issued under my direction. Have worked
with six (6) different patent firms on both Dahlgren developed and
outside developed products.

Vought Corporation (Jan. 1953-Oct. 1963)
LTV Missiles and Aerospace Division

For nearly five (5) years, I served as a Tool Engineer, responsible
for the design and development of production assembly and machine
tooling for products relating to the Aerospace industry. Six (6)
remaining years at LTV was spent in the Engineering Department,
where I served as a Test Engineer in the Experimental Laboratories
(structures group) for over three (3) years and then as a Senior
Product Design Engineer in Production Design (Wing and Controls
Groups).

United States Navy (Feb. 1951-Oct. 1953)

I served as an Aviation Structural Mechanic and Plane Captain for
two years, on active duty in the United States Naval Air Reserve.
(Total reserve service was for five (5) years from Feb. 1948 to Jan.
1953). Assignment was with a Fleet Aircraft Service Squadron
(FASRON 701) at Miramar, California (home of the Navy's present
"Top Gun" School) during the Korean War.

Mosher Steel Company (Jan. 1949-Feb. 1951)

Served in the Engineering Department of this company as a
Structural Steel Detailer/Designer, with primary responsibilities for
detailing structural steel framing (girders, beams and columns) for
large commercial and industrial buildings and bridges.

EDUCATION:

Southern Methodist University, School of Mechanical Engineering
5 years (1958-1963)

University of Texas at Arlington, School of Mechanical Engineering
2 years (1947-1949)

MISCELLANEOUS:

Member of UTA and SMU Alumni Association, TAGA (Technical
Association of the Graphic Arts), GATF (Graphic Arts Technical
Foundation), PIA (Printing Industries of America), NPES (National

James E. Taylor

Association of Suppliers to the Printing and Graphic Arts Industries), Dallas Litho Club and Rolling Hills Church of Christ (DeSoto, Texas). Past member of the Research and Engineering Council of the Graphic Arts and Graphic Communications Computer Association. Served as deacon in the church for sixteen (16) years. Married for forty-nine (49) years and father of four (4) children.

Have represented Dahlgren in technical sales areas at virtually all major printing shows and exhibitions, since 1968 to date, in Dallas, Texas; Chicago, Illinois; Philadelphia, Pennsylvania; Los Angeles, California; New York, New York; Paris, France and Dusseldorf, Germany.

Have made numerous technical presentations to audiences of from 20 - 200 in number, in the United States, Moscow, Russia and Beijing, China; primarily in the areas of product development activities of the Dahlgren Company.

Hold twelve (12) US patents primarily in the area of metering and applying viscous and non-viscous liquids for hi-speed printing and coating applications.

References furnished upon request.

BROCHURE INDEX

<u>Tab No.</u>	<u>Description</u>	
1	Dahlgren Coater Dampener	1978
2	Dahlgren - Dampener Division	Copyrighted 1981
3	IBC Blanket Coating System	1984
4	Dahlgren Coater Printer	1986
5	Dahlgren Presentation visuelle	1987
6	Oxy-Dry 2 Roll Blanket Coater	1987
7	Dahlgren - Product Data Dahlgren Blanket Coater	Approx. 1988+
8	Pictures of Rapidac Blanket Coater	Late 80's or early 90's
9	Dahlgren Product Data Bulletin	Approx. 1990
10	Dahlgrens New Lithoplus Coating System	Dated 1990
11	Dahlgren Lithoplus Coater	Dated 1990
12	Epic 3 Roll Coaters (Ctr./Dampener, Blanket and Web)	1991
13	PRI's PBC Plate/Blanket and PC Plate Coater	Early 1990s
14	Dahlgren Single Roll Coater	Approx. 1992
15	IVT Colordry, Inc. Blanket Coater	Est. early 90's
16	Dahlgren - The Greatest Performance In Printing	Early 90's
17	Dahlgren LithoPlus Coater	1995

Retraction System Designs

18	Retraction System Designs by James E. Taylor and D.R. Selby	1984-1985
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PRIOR ART

1	U.S Patent No. 2,279,204 Printing Cylinder	<i>Metal Press Mfg.</i> John P.E. Neilson	04/07/42
2	U.S. Patent No. 2,320,523 Dampening Roll for Printing Presses	<i>The Chandler & Price Co.</i> Joseph F. Jirousek	06/01/43
3	U.S. Patent No. 2,333,962	Thomas A. Terry	11/09/43
4	CH 319962 Farbwerk für Buchdruck; Offset druck-und dergleichen Maschinen für Farbendruck	<i>Maschinenfabrik Winkler, Fallert & Co. AG</i> Paul Heimlicher	03/15/57
5	Great Britain Patent No. 924401 Improvements in or relating to Ink Supplying Means for Rotary Printing Machines	Ernest Arthur Timson	04/24/63
6	U.S. Patent No. 3,397,675 Coating Apparatus	<i>West Virginia Pulp & Paper Co.</i> John De Ligt	08/20/68
7	U.S. Patent No. 3,433,155 Mechanism for Applying a Coating to a Plate	<i>Harris Intertype Corp.</i> Robert K. Norton	03/18/69
8	U.S. Patent No. 3,536,006 Multicolor Rotary Offset Printing Press with Cylinder Interruption	<i>Vandercook & Sons, Inc.</i> James Burton Roozee	10/27/70
9	U.S. Patent No. 3,604,350 Flexographic Presses with Interrupter and Cylinder Register Mechanisms	Lawrence Rosenstadt	09/14/71

10	U.S. Patent No. 3,749,011 Damping Device for Lithographic Printing Presses	<i>Roland Offsetmaschinenfabrik Faber & Schleicher AG</i> Paul Abendroth, Hans Alix, Friedrich Preuss, Fred Kunkel	07/31/73
11	U.S. Patent No. 3,768,438 Machine for Coating Sheets of Paper and the like with Liquid Coating Materials	Wilhel Kumpf	10/30/73
12	U.S. Patent No. 3,800,743 Materials Application Apparatus	<i>Xerox Corporation</i> Raymond K. Egnaczak	04/02/74
13	U.S. Patent No. 3,916,824 Device for Coating Strip Material in Continuous Operations	<i>Aluminum Norf GmbH</i> Peter Knodel, Gerhard Mayer, Horst Munsterer, Reinbold Wagner	11/04/75
14	U.S. Patent No. 3,931,791 Mechanism for Applying Lacquers and the like on a Printing Press	<i>Roland Offsetmaschinenfabrik Faber & Schleicher AG</i> Friedrich Preuss and Kurt Difflipp	01/13/76
15	U.S. Patent No. 3,986,452 Liquid Applicator for Lithographic Systems	<i>Dahlgren Manufacturing Company, Inc.</i> Harold P. Dahlgren	10/19/76
16	DE 21 51 185 B2 Mechanism for Applying Laquers and the like on a Printing Press	<i>Maschinenfabrik Augsburg- Nurnberg AG</i> Hermann Fischer	07/19/79
17	U.S. Patent No. 4,165,688 Ink Dam for Printing Press	<i>Magna-Graphics Corporation</i> Dale D. Leanna and Allen R. Jorgensen	08/28/79
18	U.S. Patent No. 4,222,325 Mounting Means for Movable Carriage on an Offset Press	<i>White Consolidated Industries, Inc.</i> Robert Edwards	09/16/80
19	U.S. Patent No. 4,270,483 Printing Coater	Denton G. Butler and Andrew W. Lester	06/02/81

20	U.S. Patent No. 4,308,796 Offset Lithographic Press with Ink Metering System for Blanket Cylinder	<i>S-W-H Ltd.</i> William L. Satterwhite	01/05/82
21	U.S. Patent No. 4,372,244 Varnishing Units on Printing Presses	<i>M.A.N.-ROLAND</i> <i>Druckmaschinen AG</i> Herbert Rebel	02/08/83
22	U.S. Patent No. 4,379,039 Ultraviolet Curable Resin Composition	Toyo Boseki Kabushiki Kaish Hiroshi Fujimoto, Hideo Miyake	04/05/83
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24	U.S. Patent No. 4,397,237 Roller Train Structure for use with Printing Machine	<i>M.A.N.-ROLAND</i> <i>Druckmaschinen AG</i> Manfred Makosch	08/09/83
25	U.S. Patent No. 4,399,767 Varnishing Unit in the Delivery Unit of a Sheet-Fed Rotary Printing Press	<i>M.A.N.-ROLAND</i> <i>Druckmaschinen AG</i> Claus Simeth	08/23/83
26	U.S. Patent No. 4,402,267 Method and Apparatus for Handling Printed Sheet Material	<i>Printing Research Corporation</i> Howard W. DeMoore	09/06/83
27	U.S. Patent No. 4,421,027 Multiple Printing Mode Printing Machine System	<i>M.A.N.-ROLAND</i> <i>Druckmaschinen AG</i> Hermann Fischer	12/20/83
28	U.S. Patent No. 4,423,677 Rotary Sheet Offset Printing Machine	<i>M.A.N.-ROLAND</i> <i>Druckmaschinen AG</i> Hermann Fischer	01/03/84
29	U.S. Patent No. 4,446,814 Device for Applying a Fluid, in Particular Lacquers on Printed Sheets or Continuous Webs	<i>M.A.N.-ROLAND</i> <i>Druckmaschinen AG</i> Paul Abendroth, Janko Despot	05/08/84

30	U.S. Patent No. 4,451,509 Radiation-Hardenable Aqueous Binder Emulsions of Acrylate Prepolymer with Unsaturated Polyester Emulsifier Having Benzyloxy and Alkylene-Oxy Groups	<i>Bayer Aktiengesellschaft</i> Walter Frank, Otto Bendszus, Jurgen Meixner, Hans J. Freier, Hans-Jaochim Traenckner	05/29/84
31	U.S. Patent No. 4,501,223 Coating Apparatus	<i>Hitachi Zosen Corporation</i> Sadayuki Matsuno, Hiroshi Itoh, Isamu Nishikawa, Tatsuo Awazu, Toshio Matsunaga, Yoshitaka Kitaoka, Goro Sugimoto, Hiroki Nishinaka	02/26/85
32	U.S. Patent No. 4,524,712 Varnish Coater for Printed Product	<i>Komori Printing Machinery Co., Ltd./Kiyoshi Ito</i>	06/25/85
33	U.S. Patent No. 4,536,218 Process and Compositions for Lithographic Printing in Multiple Layers	Eli A. Ganho	08/20/85
34	U.S. Patent No. 4,569,306 Varnish Coater for Printed Product	<i>Komori Printing Machinery Co., Ltd.</i> Kiyoshi Ito, Tamotsu Omori	02/11/86
35	U.S. Patent No. 4,574,732 Overvarnish Unit	<i>Feco Engineered Systems, Inc.</i> William G. Verwey, John C. Hovekamp	03/11/86
36	U.S. Patent No. 4,586,434 Device for Replacing Plate Cylinders	<i>Rengo Co., Ltd.</i> Masateru Tokuno, Tetsuya Sawada Hidetoshi Hoshiyama Toshihiro Yoneda	05/06/86
37	U.S. Patent No. 4,615,293 Medium-Appling Device in a Printing Machine	<i>Heidelberger Druckmaschinen AG</i> Hans-Georg Jahn	10/07/86

38	U.S. Patent No. 4,617,865 Liquid Coater for a Printing Press with Moveable Inking Roller and Tray	<i>Ryco Graphic Mfg., Inc.</i> Thomas G. Switall	10/21/86
39	EP 0270 054 A2 Slip Sheet Insertion-Delivery Apparatus for Sheet-Fed Printing Press	<i>Komori Printing Machinery Co.</i> Toshio Hoshi	12/04/86
40	EP 0293 586 A2 Geteilter Farbkasten für eine Flexodruckmaschine	<i>M.A.N. - ROLAND</i> <i>Druckmaschinen AG</i> David J. Sarazen	05/29/87
41	U.S. Patent No. 4,685,414 Coating Printed Sheets	Mark A. DiRico	08/11/87
42	U.S. Patent No. 4,704,296 Web Coating Method and Apparatus	<i>Magna-Graphics Corp.</i> Dale D. Leanna, Eugene R. Wittkopf, Allen R. Jorgensen	11/03/87
43	U.S. Patent No. 4,706,601 Device for Applying Medium After Termination of Printing Operation in a Printing Machine	<i>Heidelberger Druckmaschinen</i> <i>AG</i> Hans-Georg Jahn	11/17/87
44	U.S. Patent No. 4,753,166 Printing Machine Ink Smoother	<i>M.A.N. - ROLAND</i> <i>Druckmaschinen AG</i> Hermann Fischer	06/28/88
45	U.S. Patent No. 4,779,557 Coater for a Sheet Fed Printing Press	Joseph Frazzitta	10/25/88
46	U.S. Patent No. 4,796,528 Separated Ink Fountain for a Flexographic Printing Machine	<i>M.A.N. - ROLAND</i> <i>Druckmaschinen AG</i> David J. Sarazen	01/10/89
47	U.S. Patent No. 4,796,556 Adjustable Coating and Printing Apparatus	<i>Birow, Inc.</i> John W. Bird	01/10/89

48	U.S. Patent No. 4,815,413 Varnishing Apparatus for Printed Sheet	<i>Komori Printing Machinery Co., Ltd.</i> Toshio Kota	03/28/89
49	U.S. Patent No. 4,821,672 Doctor Blade Assembly with Rotary End Seals and Interchangeable Heads	Nick Bruno	04/18/89
50	U.S. Patent No. 4,825,804 Vertically Retracting Coater	<i>Dahlgren International, Inc.</i> Mark A. Dirico, Phillip Rodriguez	05/02/89
51	U.S. Patent No. 4,841,903 Coating and Printing Apparatus Including an Interstation Dryer	<i>Birow, Inc.</i> John W. Bird	06/27/89
52	U.S. Patent No. 4,848,265 Printing Apparatus having Coating Function	<i>Komori Printing Machinery Co., Ltd.</i> Tatsuo Komori	07/18/89
53	U.S. Patent No. 4,852,515 Device for Automatically Controlling Coating Amount for Use in Coating Machine	<i>Chugai Ro Co, Ltd.</i> Yoshiyasu Terasaka, Masao Tanabe	08/01/89
54	U.S. Patent No. 4,882,991 Change-Over Inking Unit of a Sheet-Fed Rotary Press	<i>M.A.N. - ROLAND Druckmaschinen AG</i> Claus Simeth	11/28/89
55	U.S. Patent No. 4,889,051 Removable Inking Device for Offset Press	Jean-Claude Sarda	12/26/89
56	U.S. Patent No. 4,895,070 Liquid Transfer Assembly and Method	<i>Birow, Inc.</i> John W. Bird	01/23/90

57	U.S. Patent No. 4,919,048 Apparatus for Preventing Contact of Wet Ink Sheets with Printing Press Delivery Mechanisms and for Drying Said Wet Ink	Jack D. Tyler	04/24/90
58	U.S. Patent No. 4,934,305 Retractable Coater Assembly including a Coating Blanket Cylinder	<i>Dahlgren International, Inc.</i> Jamie E. Koehler, James E. Taylor	06/19/90
59	U.S. Patent No. 4,936,211 Multicolor Offset Press with Segmental Impression Cylinder Gear	<i>Presstek, Inc.</i> Frank G. Pensavecchia, Richard A. Williams, John P. Gardiner, Stephen M. Laponsey, John F. Kline	06/26/90
60	U.S. Patent No. 4,939,992 Flexographic Coating and/or Printing	<i>Birow, Inc.</i> John W. Bird	07/10/90
61	U.S. Patent No. 4,977,828 Transfer Roller Device for Printing Presses	<i>Printing Research, Inc.</i> David D. Douglas	12/18/90
62	GB 2263 438 A Printing Apparatus	<i>The Langston Company</i> Joseph John Weishew	01/22/92
63	U.S. Patent No. 5,088,404 Delivery Apparatus for Printing Press	Edward P. MacConnell, Shigeki Matsukawa	02/18/92
64	U.S. Patent No. 5,107,790 Two Headed Coater	<i>Rapidac Machine Corp.</i> Larry J. Sliker, Robert S. Conklin	04/28/92
65	U.S. Patent No. 5,127,329 Vacuum Transfer Apparatus for Rotary Sheet-Fed Printing Presses	<i>Howard W. DeMoore</i> Howard W. DeMoore	07/07/92
66	U.S. Patent No. 5,176,077 Coating Apparatus for Sheet-Fed, Offset Rotary Printing Presses	Howard W. DeMoore, David D. Douglas and Steven M. Person	01/05/93

67	U.S. Patent No. 5,178,678 Retractable Coater Assembly Including a Coating Blanket Cylinder	<i>Dahlgren International, Inc.</i> Jamie E. Koehler, James E. Taylor, Mark A DiRico	01/12/93
68	U.S. Patent No. 5,189,960 Apparatus and Method for Controlling Temperature of Printing Plate on Cylinder in Rotary Press	Fredric Valentini, David W. Moore	03/02/93
69	U.S. Patent No. 5,209,179 Liquid Coating Apparatus for Use in Conjunction with Printing Presses Where Access of the Coating Apparatus to the Press Cylinders is Restricted	<i>Herbert Productions, Inc.</i> John C. Herbert, Frank A. Andaloro	05/11/93
70	EP 0647 529 A1 High Velocity, Hot Air Dryer and Extractor	<i>Howard W. DeMoore</i> Howard Warren DeMoore	10/06/93
71	U.S. Patent No. 5,335,596 Coating Apparatus for Sheet-Fed, Offset Rotary Printing Presses	<i>Howard W. DeMoore</i> Howard W. DeMoore, Steven M. Person	08/09/94
72	DE 4311 834 A1 Einrichtung zum Bessichten von Bedruckstoffen in Druckmaschinen	<i>M.A.N.-ROLAND</i> <i>Druckmaschinen AG</i> Georg Hartung, Ulrich Jung, Juergen Schneider	10/13/94
73	U.S. Patent No. 5,476,041 Printing Press Having a Device for Controlling the Air in a Sheet Feeder	<i>Heidelberger Druckmaschinen</i> <i>AG</i> Ernst Czotscher	12/19/95

(Patents and Brochures)

[illegible]**Codes:**

- (1) S = Sheet-Fed; W = Web Fed
(2) AR = Single Anilox Roll With Blades or with Metering Roll; 2R = Two Roll; 3R = Three Roll, 1=Litho
(3) I = Inclined; H = Horizontal; V = Vertical; F = "Ferts"; T = Transverse; FB = Four (4) Bar Linkage, XY = Combination
(*) Taylor Sketches = F, FB & V / H; Selby Sketches = VM, I, FB & F

Prefix (P) = Patent Number
Prefix (B) = Brochure Number
Prefix (S) = Sketch

TAYLOR EXHIBIT D

Claims of Serial No. 08/435,798

Filed May 4, 1995 - Pending as of Summer 2000

1. In a printing press of the type having side frame members forming a printing unit tower on which a plate cylinder and blanket cylinder are support for rotation, the improvement comprising:

inking/coating apparatus for applying ink or coating material directly to a plate mounted on the plate cylinder or directly to a blanket mounted on the blanket cylinder when the inking/coating apparatus is in an operative position; and

a carriage assembly including a support arm having a first end portion pivotally mounted to the printing unit tower and a second end portion pivotally mounted to the inking/coating apparatus, the carriage assembly being movable to an operative position in which the inking/coating apparatus is suspended laterally adjacent to the plate and blanket cylinders, and being movable to a retractable position in which the inking/coating apparatus is elevated with respect to the plate and blanket cylinders.

2. The invention as set forth in claim 1, wherein the inking/coating apparatus comprises:

a doctor blade assembly having a reservoir for receiving ink or liquid coating material;
an applicator roller coupled to the doctor blade assembly in fluid communication with the reservoir, the applicator roller being engagable with a printing plate on the plate cylinder or with a blanket on the blanket cylinder when the inking/coating apparatus is in the operative position.

3. The invention as set forth in claim 2, the applicator roller comprising:
an anilox roller having a resilient transfer surface.

4. The invention as set forth in claim 1, including a counterweight coupled to the support arm.

5. The invention as set forth in claim 1, further comprising:
a power actuator pivotally coupled to the support arm, the power actuator having a power transfer arm which is extendable and retractable; and,
apparatus coupled to the power transfer arm for converting extension or retraction movement of the power transfer arm into pivotal movement of the inking/coating apparatus relative to the support arm.

6. In a printing press of the type having side frame members forming a printing unit tower on which a plate cylinder and blanket cylinder are support for rotation, the improvement comprising:

inking/coating apparatus for applying ink or coating material to a plate mounted on the plate cylinder or to a blanket mounted to a blanket cylinder when the inking/coating apparatus is in an operative position;

a carriage assembly including a support arm having a first end portion pivotally mounted to the printing unit tower and a second end portion pivotally mounted to the inking/coating apparatus, the carriage assembly being movable to an operative position in which the inking/coating apparatus is suspended laterally adjacent to the plate and blanket cylinders, and being movable to a retractable position in which the inking/coating apparatus is elevated with respect to the plate and blanket cylinders;

a power actuator pivotally coupled to the support arm, the power actuator having a power transfer arm which is extendable and retractable;

apparatus coupled to the power transfer arm for converting extension or retraction movement of the power transfer arm into pivotal movement of the inking/coating apparatus relative to the support arm;

the movement converting apparatus;

a bell crank plate having a first end portion coupled to the power transfer arm and having a second end portion for engaging a stop member;

a stop member secured to the inking/coating apparatus; and

a cleavis plate secured to the support arm and pivotally coupled to the bell crank plate.

7. The invention as set forth in claim 1, the inking/coating apparatus comprising:

an applicator head having first and second side frame members pivotally coupled to the carriage assembly;

a doctor blade assembly mounted between the first and second side frame members, the doctor blade assembly including a reservoir for receiving ink or liquid coating material;

cradle means mounted on the first and second side frame members, respectively;

an applicator roller mounted for rotation on the cradle means and coupled to the doctor blade assembly for rolling contact with ink or coating material in the reservoir, the applicator roller being engagable with a printing plate on the plate cylinder or with a blanket cylinder in the operative position; and

motor means coupled to the applicator roller for rotating the applicator roller.

8. The invention as set forth in claim 7,

the cradle means including first and second sockets disposed on the first and second side frame members respectively; and,

the applicator roller being mounted for rotation on the first and second sockets.

9. In a printing press of the type having side frame members forming a printing unit tower on which a plate cylinder and blanket cylinder are supported for rotation, the improvement comprising:

inking/coating apparatus for applying ink or coating material to a plate mounted on the plate cylinder or to a blanket cylinder mounted on the blanket cylinder when the inking/coating apparatus is in an operative position;

a carriage assembly including a support arm having a first end portion pivotally mounted to the printing unit tower and a second end portion pivotally mounted to the inking/coating apparatus, the carriage assembly being movable to an operative position in which the inking/coating apparatus is suspended laterally adjacent to the plate and blanket cylinders, and being movable to a retractable position in which the inking/coating apparatus is elevated with respect to the plate and blanket cylinders;

the inking/coating apparatus comprising:

an applicator heading first and second side frame members pivotally coupled to the carriage assembly;

a doctor blade assembly mounted between the first and second side frame members, the doctor blade assembly including a reservoir for receiving ink or liquid coating material;

cradle means mounted on the first and second side frame members, respectively;

an applicator roller mounted for rotation on the cradle means and coupled to the doctor blade assembly for rolling contact with the ink or coating material in the reservoir, the applicator roller being engagable with a printing plate on the plate cylinder or with a blanket on the blanket cylinder in the operative position; and

motor means coupled to the applicator roller for rotating the applicator roller;

the cradle means including first and second sockets disposed on the first and second side frame members, respectively, and third and fourth sockets disposed on the first and second side frame members respectively;

the applicator roller being mountable for rotation on the first and second sockets for applying ink or coating material to the plate when the carriage assembly is in the operative position; and

the applicator roller being mountable for rotation on the third and fourth sockets for applying ink or coating material to the blanket when the carriage assembly is in the operative position.

10. The invention as set forth in claim 1, comprising:

male and female latch coupling members mounted on the carriage assembly and on the printing unit tower, respectively, for releasably latching the carriage assembly in interlocking engagement with the printing unit tower in the operative position.

11. The invention as set forth in claim 1, wherein the support arm comprises an elongated shank portion and a hub portion which extends transversely with respect to the shank portion, the elongated shank portion being pivotally coupled to the inking/coating apparatus and the hub portion being pivotally coupled to the printing unit tower.

12. A sheet fed, rotary offset printing press comprising, in combination:

at least one printing unit or dedicated coating unit having side frame members forming a tower;

at least one cylinder mounted for rotation on the tower for printing ink or coating material onto sheets passing through the printing unit or dedicated coating unit, the cylinder mounting either a plate or a blanket;

inking/coating apparatus including a doctor blade assembly having a reservoir for holding ink or coating liquid, a rotatable applicator roller and means for applying ink or coating liquid from the reservoir onto a peripheral surface portion of the applicator roller; and

support apparatus mounted on the tower for pivotal movement, the inking/coating apparatus pivotally mounted to the support apparatus, the support apparatus movable relative the printing unit tower between an operative position in which the applicator roller is directly engaged with a plate or blanket on the cylinder and a retracted position in which the inking/coating apparatus is support at an elevated position above the cylinder.

13. A rotary offset printing press comprising, in combination:

a plate cylinder having a printing plate mounted thereon;

a blanket cylinder having an ink receptive blanket disposed in ink transfer engagement with the plate cylinder for transferring ink from the image surface areas of the printing plate to the receptive blanket;

an impression cylinder disposed adjacent the blanket cylinder thereby defining a nip between the impression cylinder and the blanket whereby the printing ink is transferred from the blanket to a substrate as the substrate is transferred through the nip;

inking/coating apparatus for applying ink or coating material to the plate or to the blanket;

support apparatus pivotally mounted on the printing press, said support apparatus and said inking/coating apparatus being pivotally connected, said support apparatus being pivotal between an operative position in which the inking/coating apparatus is directly engaged with the

plate or the blanket, and a retracted position in which the inking/coating apparatus is supported at an elevated position above the press; and

a dryer mounted on the press for discharging heated air on the freshly printed substrate.

14. A rotary offset printing press as defined in claim 13, wherein:

the dryer is mounted adjacent the impression cylinder for discharging heated air onto a freshly printed substrate while the substrate is in contact with the impression cylinder.

15. A rotary offset printing press as defined in claim 13, comprising:

an extractor coupled to the dryer for extracting hot air, moisture and volatiles from an exposure zone between the dryer and the freshly printed substrate.

16. A rotary offset printing press as defined in claim 13, comprising:

a transfer cylinder disposed in an interstation position on the press and coupled in sheet transfer relation with the impression cylinder; and,

an interstation dryer disposed adjacent the transfer cylinder for discharging heated air onto a freshly printed or coated substrate after it has been transferred from the impression cylinder and while it is in contact with the intermediate transfer cylinder.

17. In a printing press of the type having side frame members forming a tower on which a blanket cylinder is supported for rotation, the improvement comprising:

inking/coating apparatus for applying ink or coating material to a blanket mounted on the blanket cylinder when the inking/coating apparatus is in an operative position; and

a carriage assembly pivotally mounted to the tower and to the inking/coating apparatus, said carriage assembly movable between an operative position and a retracted position, said inking/coating apparatus pivoting relative the carriage assembly as the carriage assembly is moved between the operative position and retracted position to maintain a relatively constant orientation to the horizontal, the inking/coating apparatus in direct contact with the blanket cylinder in the operative position and elevated with respect to the blanket cylinder in the retracted position.

18. In a printing press of the type having side frame members forming a tower on which a blanket cylinder is supported for rotation, the improvement comprising:

inking/coating apparatus for applying ink or coating material to a blanket mounted on the blanket cylinder when the inking/coating apparatus is in an operative position;

a carriage assembly pivotally mounted to the tower and to the inking/coating apparatus, said carriage assembly movable between an operative position and a retracted position, said inking/coating apparatus pivoting relative the carriage assembly as the carriage assembly is moved between the operative position and retracted position to maintain a relatively constant orientation to the horizontal;

tower including a plate cylinder and a plate mounted on the plate cylinder, the inking/coating apparatus including:

first cradle means for supporting an applicator roller for engagement against the plate when the inking/coating apparatus is in the operative position; and

second cradle means for supporting an applicator roller for engagement against the blanket when the inking/coating apparatus is in the operative position.

19. In a printing press of the type having side frame members forming a tower on which a blanket cylinder is supported for rotation, the improvement comprising:

inking/coating apparatus for applying ink or coating material to a blanket mounted on the blanket cylinder when the inking/coating apparatus is in an operative position;

a carriage assembly pivotally mounted to the tower and to the inking/coating apparatus, said carriage assembly movable between an operative position and an retracted position, said inking/coating apparatus pivoting relative the carriage.

20. The invention as set forth in claim 17, further comprising:

a power actuator pivotally coupled to the support arm, the power actuator having a power transfer arm which is extendable and retractable; and,

apparatus coupled to the power transfer arm for converting extension or retraction movement of the power transfer arm into pivotal movement of the inking/coating apparatus relative to the common pivot shaft.

21. In a printing press of the type having side frame members forming a tower on which a blanket cylinder is supported for rotation, the improvement comprising:

inking/coating apparatus for applying ink or coating material to a blanket mounted on the blanket cylinder when the inking/coating apparatus is in an operative position;

a carriage assembly pivotally mounted to the tower and to the inking/coating apparatus, said carriage assembly movable between an operative position and a retracted position, said inking/coating apparatus pivoting relative the carriage assembly as the carriage assembly is moved between the operative position and retracted position to maintain a relatively constant orientation to the horizontal;

a power actuator pivotally coupled to the support arm, the power actuator having a power transfer arm which is extendable and retractable;

apparatus coupled to the power transfer arm for converting extension or retraction movement of the power transfer arm into pivotal movement of the inking/coating apparatus relative to the common pivot shaft;

the movement converting apparatus comprising:

a bell crank plate having a first end portion coupled to the power transfer arm and having a second end portion for engaging a stop member;

a stop member secured to the inking/coating apparatus; and,

a cleavis plate secured to the support arm and pivotally coupled to the bell crank plate.

22. The invention as set forth in claim 1, wherein the inking/coating apparatus comprises:

an applicator roller having a resilient transfer surface.

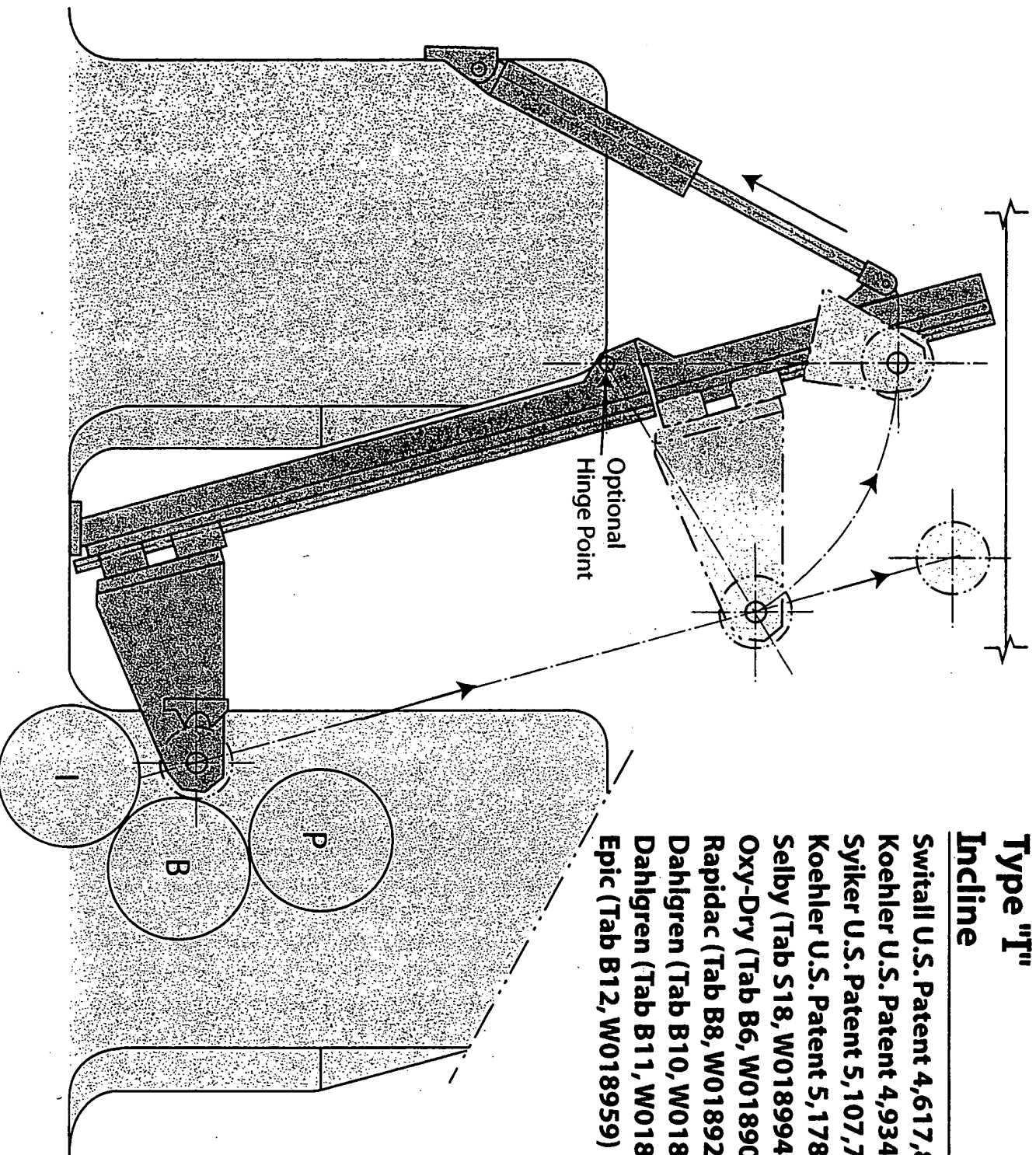
23. The invention as set forth in claim 1, wherein the applicator roller is mounted for engagement to a plate in the plate cylinder position, the applicator roller comprising an anilox roller having a resilient transfer surface.

Known Retraction System Adapted for Interstation Use

Type "I"

Incline

Switall U.S. Patent 4,617,865 (Tab P38, W019343)
Koehler U.S. Patent 4,934,305 (Tab P58, W019519)
Syiker U.S. Patent 5,107,790 (Tab P64, W019592)
Koehler U.S. Patent 5,178,678 (Tab P67, W019630)
Selby (Tab S18, W018994)
Oxy-Dry (Tab B6, W018904)
Rapidac (Tab B8, W018925)
Dahlgren (Tab B10, W018940)
Dahlgren (Tab B11, W018945)
Epic (Tab B12, W018959)



Known Retraction System Adapted for Interstation Use

Type "H"

Horizontal

Rosenstadt U.S. Patent 3,604,350 (Tab P9, W019089 and W019092)

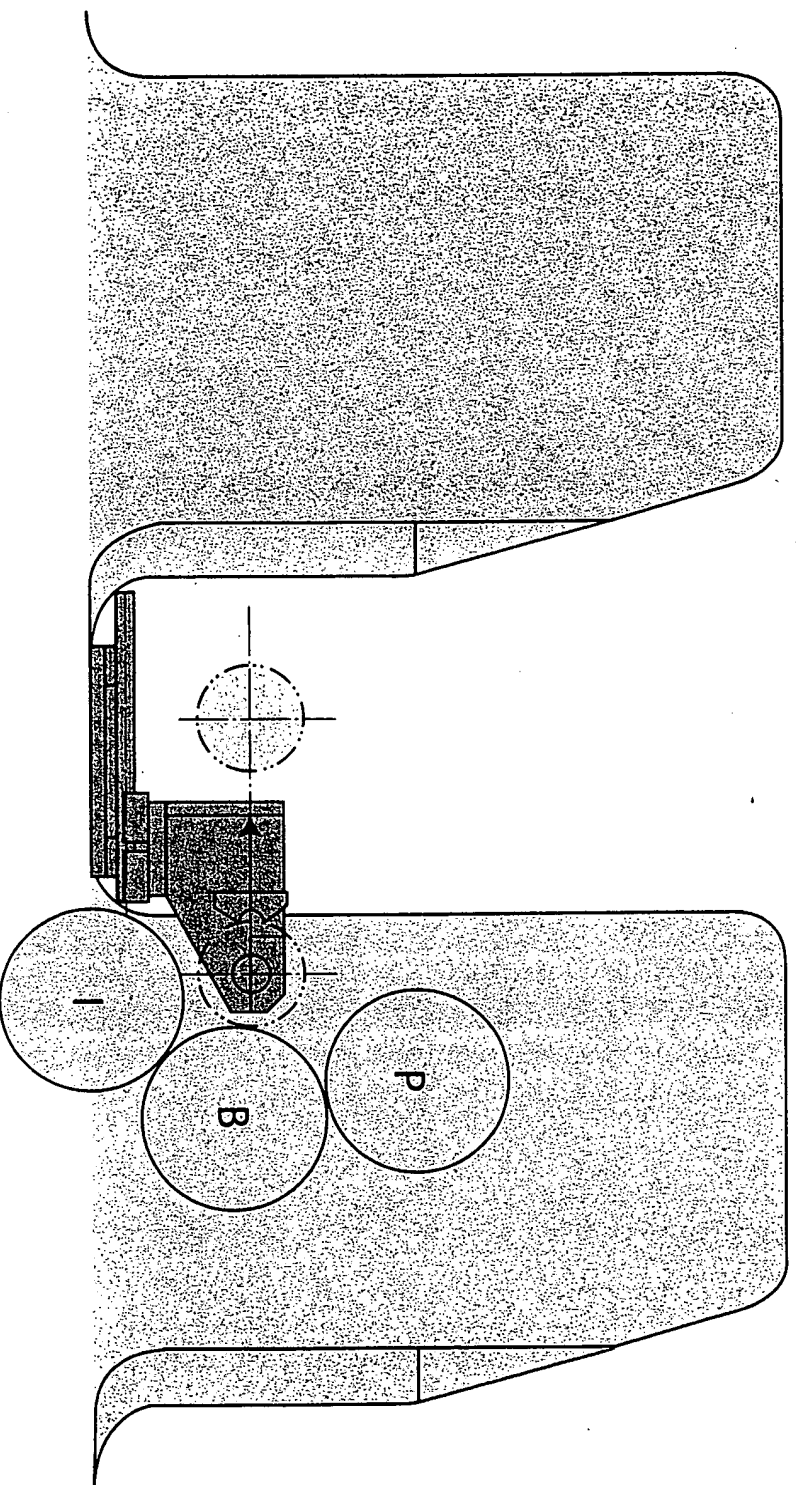
Di Rico U.S. Patent 4,685,414 (Tab P41, W019373 and W019374)

Dahlgren (Tab B4, W018890 and W018892)

Dahlgren (Tab B5, W018898 and W018900)

Dahlgren (Tab B7, W018919)

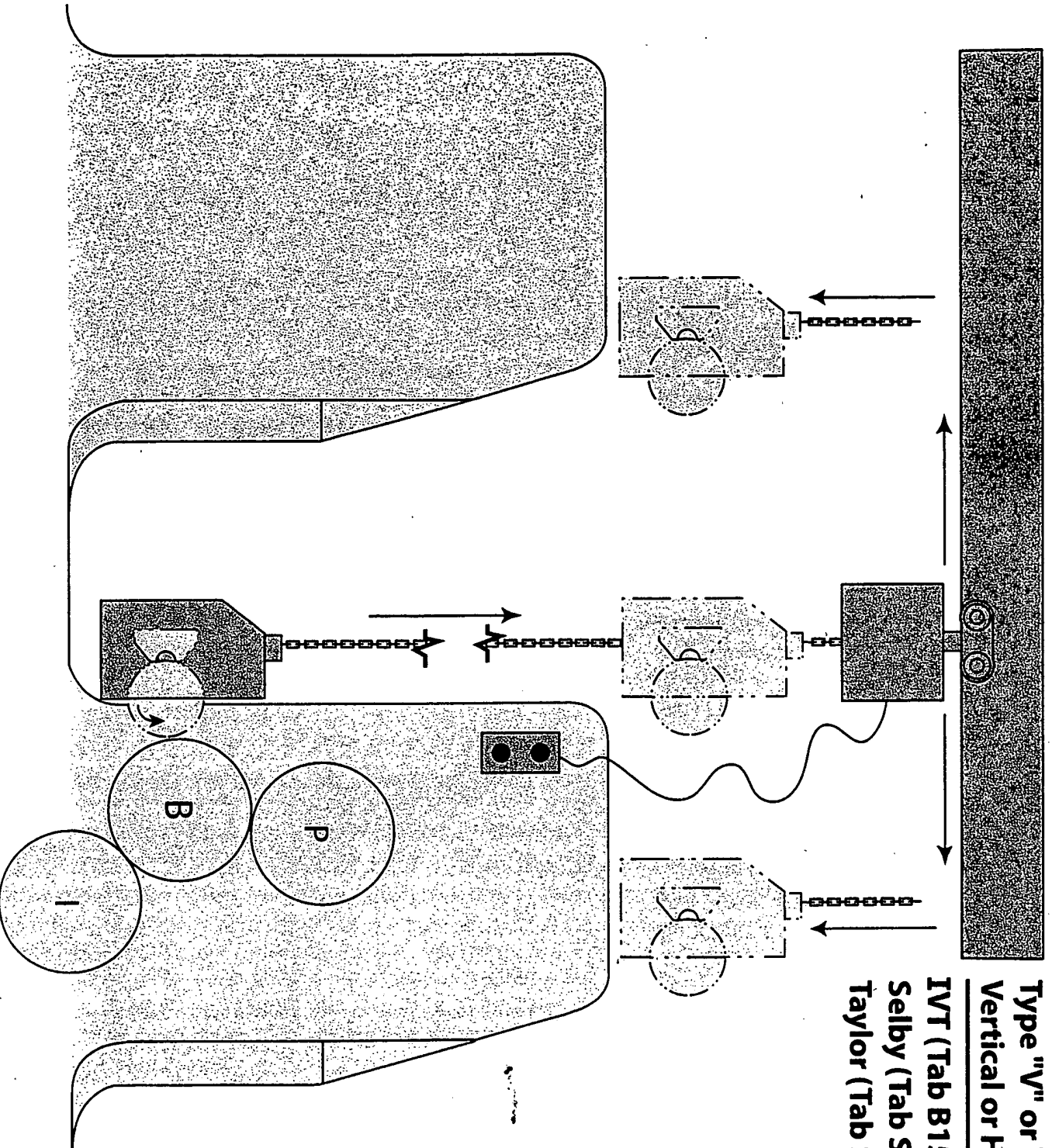
Dahlgren (Tab B9, W018935)



Known Retraction System Adapted for Interstation Use

Type "V" or "H/V" or "V/H"
Vertical or Horizontal and Vertical

IVT (Tab B15, W018977)
Selby (Tab S18, W018991)
Taylor (Tab S18, W019000)



Known Retraction System Adapted for Interstation Use

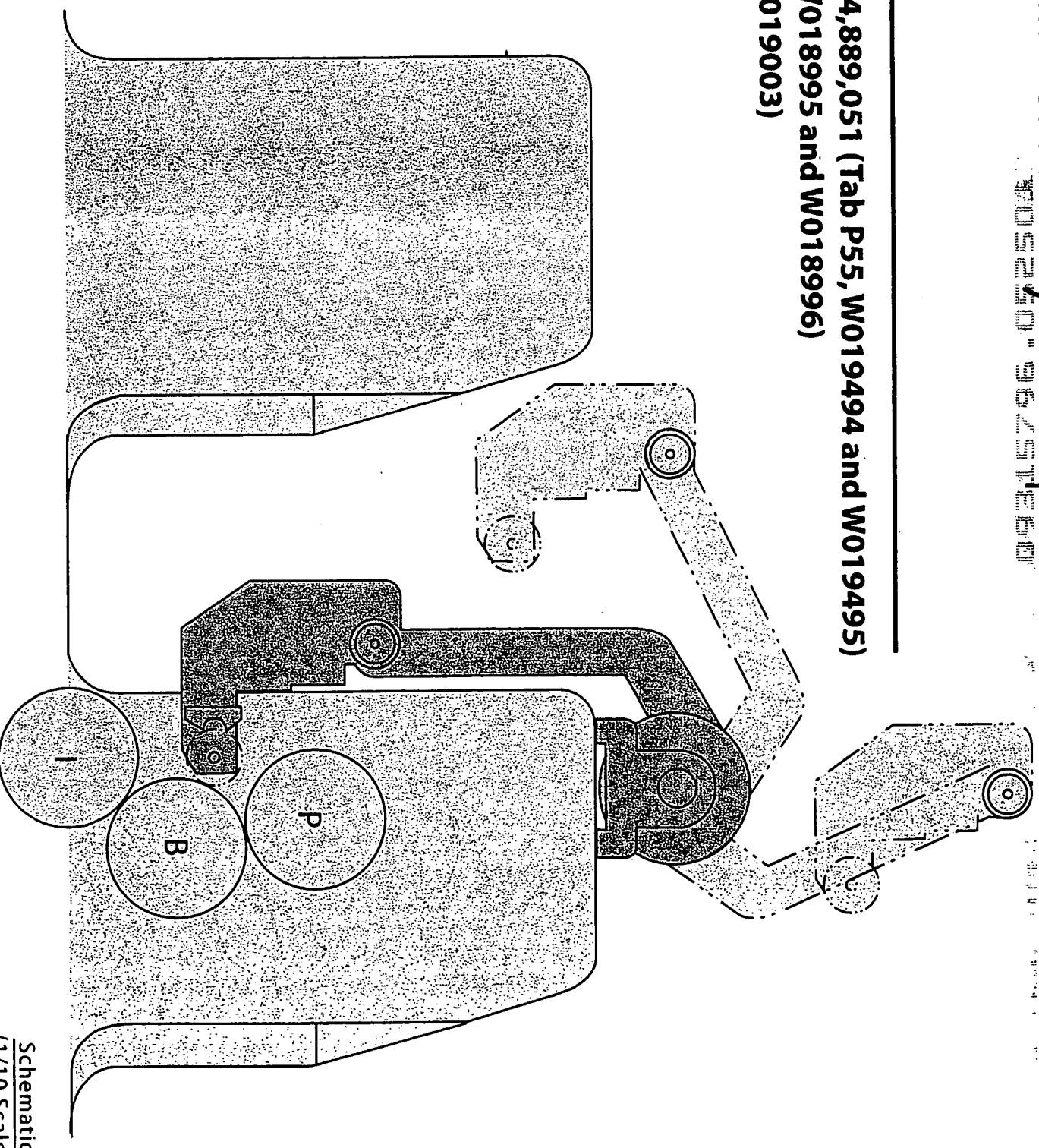
Type "F"

Ferris Wheel

Sarda U.S. Patent 4,889,051 (Tab P55, W019494 and W019495)

Taylor (Tab S18, W018995 and W018996)

Selby (Tab S18, W019003)



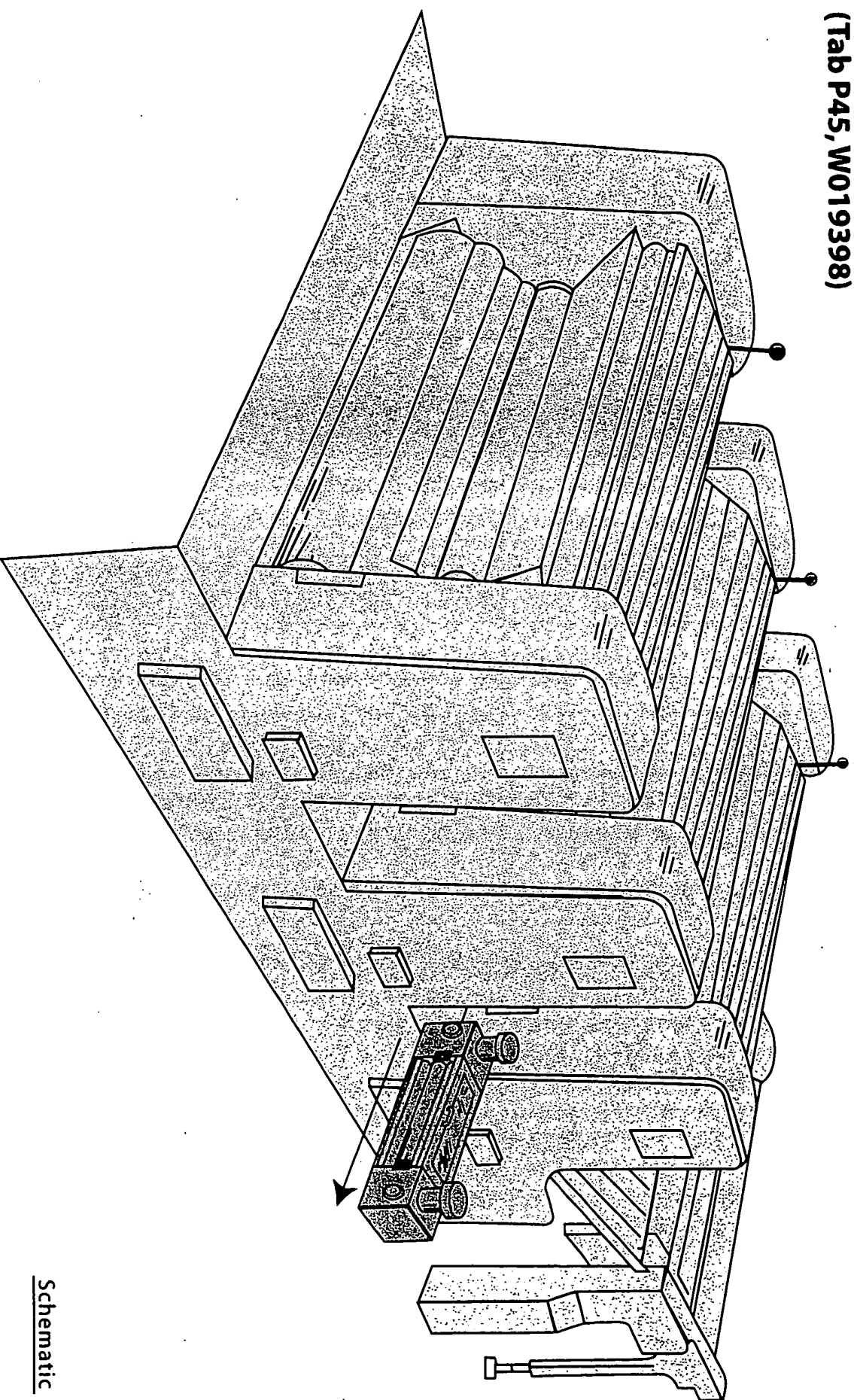
Known Retraction System Adapted for Interstation Use

Type "T"

Transverse

Frazzitta U.S. Patent 4,779,557

(Tab P45, W019398)



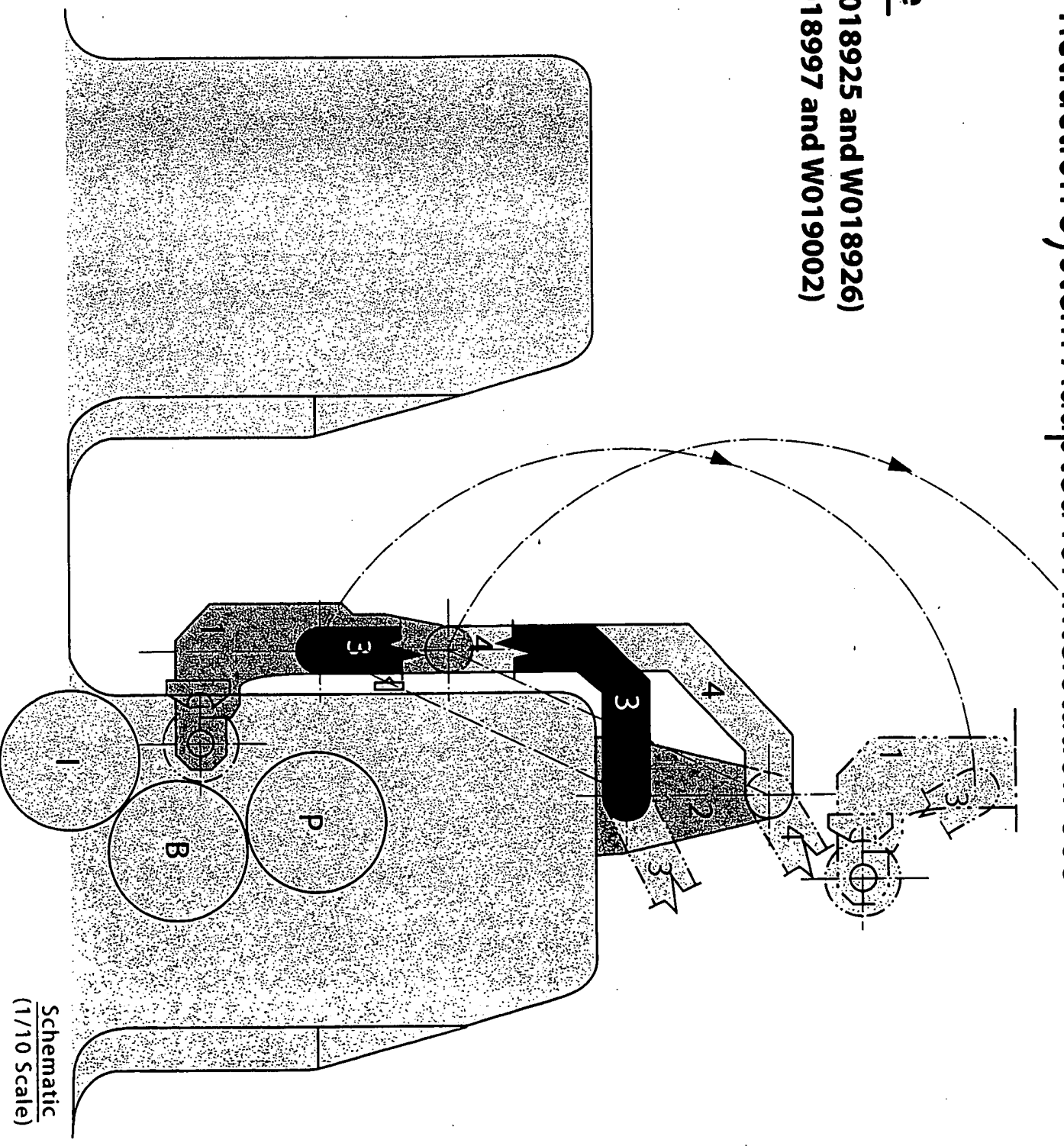
Known Retraction System Adapted for Interstation Use

Type "FB"

Four Bar Linkage

Rapidac (Tab B8, W018925 and W018926)

Taylor (Tab S18, W018997 and W019002)

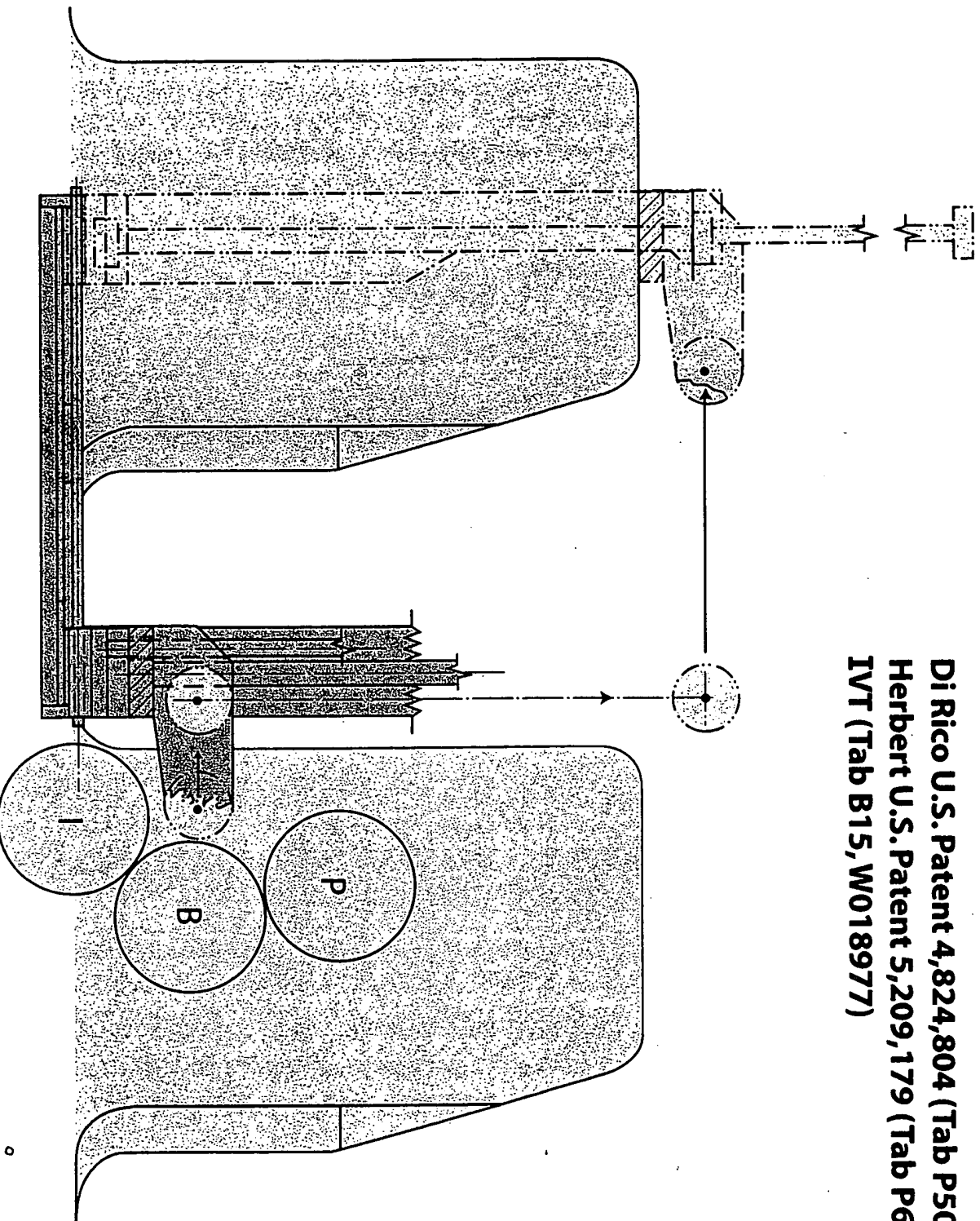


Schematic
(1/10 Scale)

Known Retraction System Adapted for Interstation Use

Type "X/Y" Combination
"H/V" or "H/I" or "V/H" or "I/V"

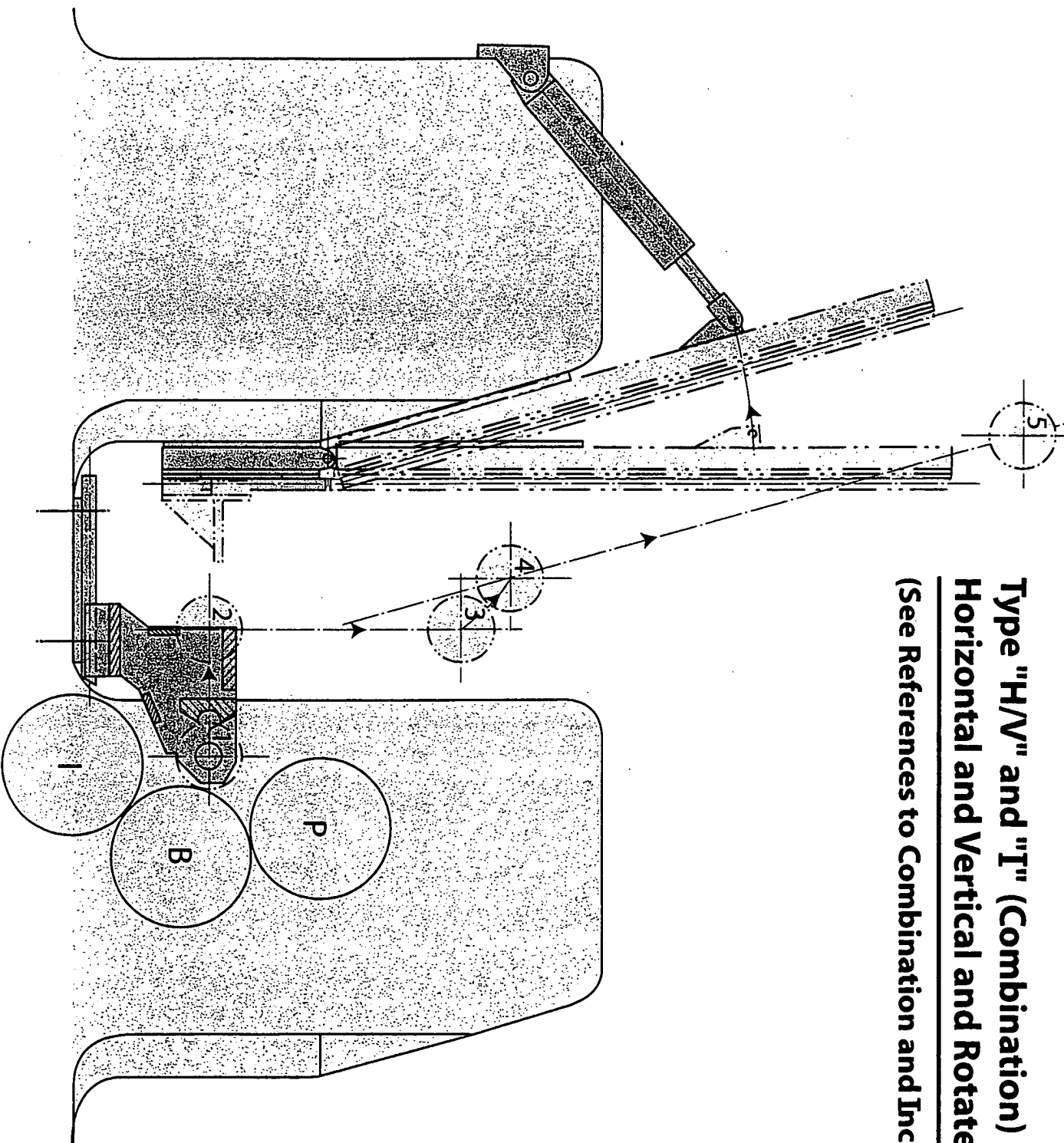
Di Rico U.S. Patent 4,824,804 (Tab P50, Fig. 2, W019446)
Herbert U.S. Patent 5,209,179 (Tab P69, W019658)
IVT (Tab B15, W018977)



Known Retraction System Adapted for Interstation Use

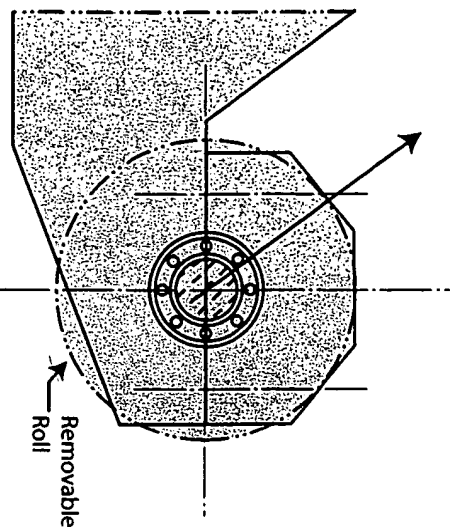
TOP SECRET

Type "H/V" and "I" (Combination)
Horizontal and Vertical and Rotate to Incline
(See References to Combination and Incline)

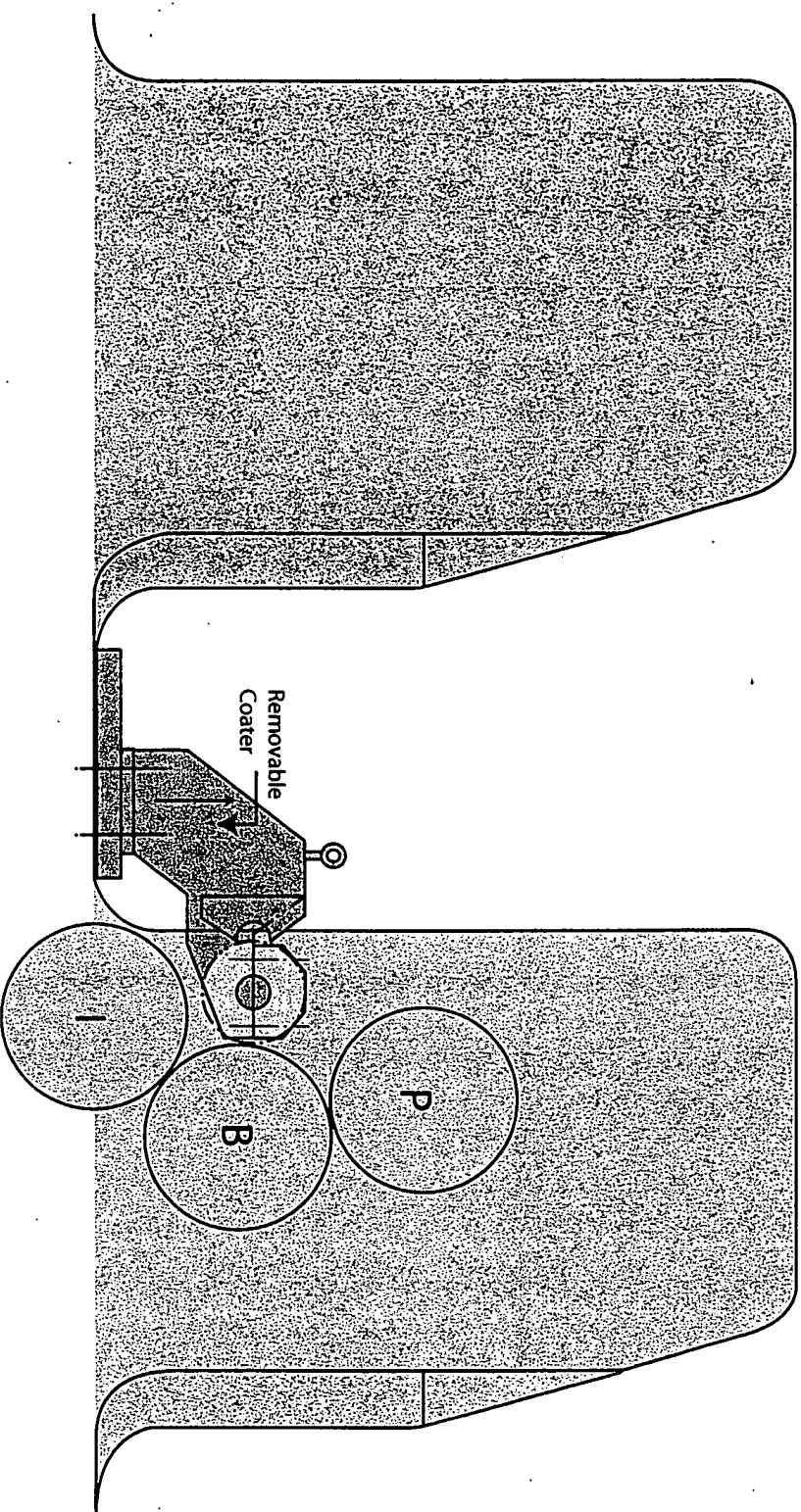


Known Manually Removable Coater or Roll

105651 "SESTEBO



Terry U.S. Patent 2,333,962 (Tab P3, W019031)
Satterwhite U.S. Patent 4,308,796 (Tab P20, W019185)
Tokuno U.S. Patent 4,586,434 (Tab P36, W019329)
Rapidac (Tab B8, W018933)



COST AND QUALITY:

A

DAMPENER DILEMMA?

By James E. Taylor

The late Hiram Dahl, who 30 years ago pioneered today's continuous-duty dampening technology, once said, "You can count on one hand those who really understand the principles and intricacies of lithography and the dampening process."

The natural question is, who did he mean?

Having spent many years under the instruction of Mr. Dahlgren, I learned a good deal about continuous-duty dampening, and what follows is a discussion on the cost factors and quantitative advantages of this technology as it applies to today's sheet and web-offset press printers.

Basically, a continuous-duty dampener dampens the plate and blanket of an offset lithographic press with a system of rolls and nozzles that is constantly fed by a variable-speed water supply. Whether the press is running or stopped.

This differs from press-driven, conventional dampeners which use a motor brush and provide no water control. It is not a random water application as when the press run is interrupted.

Continuous-duty dampeners permit precise water control. Water to the plate and blanket is the dampener's supply. With conventional dampeners, the water is applied either by the press-driven brush or by the printed blanket. The water is applied where it is needed, and it is distributed and related properly and at the proper times.

For the printer who demands premium quality and cost control, there is no substitute for a high-quality continuous-duty dampener.

Many printers with conventional dampeners can achieve quality just as high, but they know that they can compete without a continuous-duty system. They know that the present market will push continuous-duty dampeners may, at least, be more than what a used press is worth.

Never, if you plan to keep the press for more than a year, the investment will not only pay off through savings in reduced printed waste and downtime but, you will also benefit from a significant positive cash flow over an amortized five-year payout. And eventually when you do sell your used press, it will command a higher price.

There are many reasons why it is estimated that

values a continuous-duty dampener as an add-on to a commercial offset sheet or web lithographic press operation.

- a) **Increased quality of the printed product.**
- b) **Consistency due to the continuous process**
- c) **Efficiency in ink/water balance**
- d) **Ease of printing combination layouts**
- e) **Flexibility to use a broader range of stocks**
- f) **Reduced pressman fatigue**
- g) **Time savings**
- h) **Reduced waste**
- i) **Economies in drying**
- j) **Less expense in offset spray powders**
- k) **Faster back-up; trimming, folding, etc.**
- l) **Reduced maintenance on equipment**
- m) **Increased productivity**
- n) **Savings in chemical & ink usage**

For a better understanding of how continuous-duty dampening can deliver the results on your press, consider the following areas of performance.

Increased Quality of the Printed Product

Because a continuous-duty dampener provides precise water control, a thinner film of ink can be used. As a result, your press will print cleaner, sharper and more brilliant colors, with higher contrast. The ink will be laid down deeper. If you're using a conventional dampener, you'll achieve these qualities only under ideal printing conditions. A continuous-duty dampener enables the highest quality printing.

Consistency Due to the Continuous Process

Since a continuous-duty dampener is constantly running, there is no interruption of the flow of the ink. There are no stoppages or delays in the

ink/water balance. Color remains as constant and uniform as the ink feed, with fewer adjustments and delays. You save time and fatigue because, unlike a conventional dampener, there's no need for constant attention and re-adjustment throughout the run.

Efficiency in Ink/Water Balance

Continuous-duty dampening meters water in the precise minimum quantity demanded by the ink. With a conventional dampener, if there's too much water, the ink becomes contaminated and loses its body and tinctorial strength. Weak ink means more ink, which plugs halftones and weakens solids. Precise ink/water balance permits brilliant solids, thinner films and the clean, sharp reverses and shadows you get from using a dry, full-bodied ink.

Ease of Printing Combination layouts

Because you don't have to compensate with the water stops of a continuous-duty dampener, printing difficult layouts, short sheets and large non-printing areas is simplified. No water invades the ink, so stripping and emulsification is eliminated. And because you don't plug delicate half tones and reverses, you can print the finest 90% shadow dot clean and open, while holding strong, adjacent solids up to color. In short, a continuous-duty dampener lets you print the plate, regardless of the layout without all of the problems you normally have to put up with.

Flexibility to Use a Broader Range of Stocks

The combined qualities of a continuous-duty dampener allow you to print efficiency and profitably on good enamels, foil, gummed stock (even on the gummed side) as well as plastics, metal and all non-absorbing specialty papers, none of which can tolerate any surplus water. Unlike conventional dampeners, a continuous-duty dampener does not limit your profit potential, now you can print the tough jobs you used to shy away from.

Reduced Pressman Fatigue

A continuous-duty dampener achieves water balance in 1/2 the time it takes for a conventional dampener to do the same. When you change a setting, you get a response on the next revolution, not 50 or 100 sheets later. You can start or resume printing without color variation due to water, as soon as the inker is recharged. As a result, productivity is increased and excess waste eliminated.

Minutes a day, hours a week, a continuous-duty dampener will add to your productive time, allowing you to print as quickly as the form rollers are inked.

Efficiencies in the Wash Up Phase

Wash up and shutdown times are reduced with a continuous-duty dampener, because the form roller inks and washes automatically with every revolution of the press. The transfer and metering rolls need no special attention when changing jobs or colors, so downtime is reduced.

Reduced Waste During Proofing

Press proofs and progressives are produced quickly because only a handful of sheets are needed to get 10 or 12 good proofs. Compare that with the hundreds normally required by a conventional system, and you'll see why a press equipped with a continuous-duty dampener allows you to get proofing colors on and off the press before conventionally equipped systems even get up to color.

What's more, going from color to color is easier because no time is lost cleaning or replacing dampener sleeves. Make subtle changes for "darker" or "lighter" proofs on as few as one or two sheets, then return to the original shade on the next revolution. Simulation runs are more practical, proofing time and cost is reduced and, dot-for-dot reproduction can be achieved from the proofing plate.

Economies in Drying

A continuous-duty dampener prints with less moisture in the ink and sheet, providing a thinner, drier, tackier ink film. The advantages include better trapping and smoother lays, with less curl in the paper and less offset spray. Printed sheets usually set and dry in half the time it takes for a conventionally printed piece. And because sheets dry faster and more uniformly, back up, trimming and folding can be accomplished faster.

Overall Benefits

In all, continuous-duty dampening provides for less sheet waste, reduced ink and chemical usage, less downtime for startup, restarts or maintenance and faster wash up than printing with a conventional dampener. And while an expert pressman, with a good press, ideal conditions and continual attention can approach the quality associated with continuous-duty dampeners, the cost in terms of maintenance, press downtime and waste makes printing with conventional dampeners outmoded, impractical and even prohibitive for a profitable operation.

Cost Justification

As an example of cost-justification for the purchase of a continuous-duty dampener, consider a 4/C, 40", hi-speed commercial sheet-fed offset press. The total price of a continuous-duty dampener for this system could run approximately \$90,000.00.

On a 60-month note you would pay \$1,500 principal and \$468.75 approximate interest per month for a total monthly payment of \$1,968.75.

Using a conservative monthly expense reduction, you could figure sheet waste with conventional dampeners at 200 sheets x 4 setups (startup jobs or restarts due to color loss or other dampener-related problems) x 25 shifts for a total of 20,000 sheets per month. At \$80.00 per 1,000 sheets, this is a waste per month of \$1,600.00.

COST JUSTIFICATION OF CONTINUOUS DUTY DAMPENERS

Savings compared to conventional dampeners

Normal paper waste per month

200 sheets of paper per set-up
x 4 set-ups per shift
800 sheets per shift
x 25 shifts per month
20,000 sheets per month

20,000 sheets at \$80 per 1,000 sheets = \$1,600 mo.

Normal equipment downtime and labor cost per mo.

1 hour downtime per set-up
x 4 set-ups per shift
4 hours per shift
x 25 shifts per month
100 hours per month

100 hours of downtime at \$200 per hour \$20,000 mo
Total cost [paper and downtime] \$21,600 mo

Savings of 60% of cost of paper and downtime x .60
by using continuous duty dampeners \$12,960 mo

Purchase price of continuous duty dampeners:
approximately \$90,000

Cost per month on 5 year note

\$1,500 principal per month
468 per month
\$1,968 total payment \$ -1,968 mo.

Potential additional monthly profits
during 60 month note \$10,991 mo

\$90,000 + \$10,991 = 8.19

This would represent a payback of approximately 8 months on total capital invested. It does not include depreciated or retained value.

Downtime on conventional dampeners could be estimated at 60 minutes x 4 setups x 25 shifts for 6,000 minutes, or 100 hours wasted each month. At an all-inclusive hourly cost of \$200.00, the total monthly loss from downtime with conventional dampeners would be \$20,000.00. Adding the paper cost of \$1,600.00, gives us a \$21,600 per month total loss for downtime and materials.

Using these figures, a continuous-duty dampener will reduce your monthly expense of \$21,600.00 by 60%, or \$12,960.00. After subtracting a monthly payment of \$1,968.75, a continuous-duty dampening system provides a potential positive cash flow of \$10,991.25 each month. Looking at this from a payback point-of-view, you would easily recoup your investment in as few as eight months.

Obviously, you don't have to be one of the few "who really understands the principals and intricacies of lithography and the dampening process" to appreciate the economies of continuous-duty dampening. The money lost on waste and downtime can be yours. In fact, it may be the difference in whether you're profitable or not. Before you lose more money on your conventionally equipped press, consider what you stand to gain by adding a continuous-duty dampening system.

What to Look For In a Continuous-Duty Dampener

Since the original Dahlgren dampener patents expired a few years ago, many press manufacturers have designed continuous-duty dampeners for their presses; therefore, there are several continuous-duty dampeners available for both existing and new presses. The number of rolls in the system can vary from three to as many as seven. The composition and position of the rolls can also vary widely. One or more rolls may have a resilient surface, while others may have a hydrophilic (water receptive/ink rejecting) surface. Some designs have a frictionally rotated dampening form roll driven from a press-driven, adjacent ink or dampener roll, while others may be more positively geared or motor driven near, greater or less than plate-surface speed. For example, Dahlgren introduced a four (4) roll coater-dampener in the late 70s and early 80s, wherein an inked form roll, bridged to the inker via an idler roll, was capable of running greater than, equal to or less than press plate surface speed in both coating and dampening modes of operation. (The bridge roll was removed when coating.) For example, the efficiency, simplicity of operation, water control and maintenance required for each design is different. However, most continuous-duty dampeners share certain common features, particularly these 10:

1) A resilient covered, non-absorbent receptacle for dampening fluid (applicator/form) roll.

2) An independently driven, variable speed transfer roll. (some have hard chrome hydrophilic surfaces, while others are resilient covered rolls).

3) A metering roll normally geared to the transfer roll, either 1:1 or at a fixed differential. (Again, some have hard chrome hydrophilic surfaces, while others have resilient covers.)

4) A dampening fluid supply at the entrance to the nip, between the transfer and metering rolls.

5) Pressure contact at all adjacent roll surfaces (normally, surfaces alternate between hard and resilient).

6) A continuously recirculated dampening fluid supply system wherein the fluid can be filtered and temperature-controlled as desired.

7) Lateral control of dampening fluid across the length of the rolls (skewed or crowned metering roll).

8) Transfer and meter rolls normally being longer and extending past the ends of an adjacent dampener roll.

9) Alcohol or alcohol substitute replacement in the fountain solution. The alcohol can range from 5-25% of the total amount of solution.

10) Positive, adjustable roll settings (No springs)

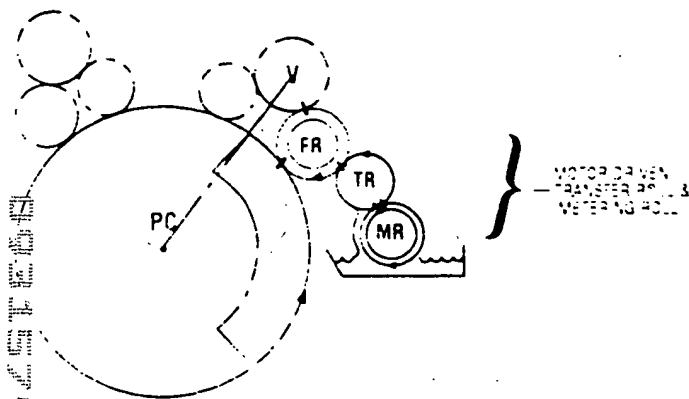
Following are the Dahlgren Three (3) and four (4) Roll Differential-Driven Dampener schematics, with accompanying descriptions. Note: All of the above ten (10) features are incorporated on these dampeners.

Schematic and Description: Dahlgren Three (3) Roll

This Dahlgren system of dampening is designed for sheet or web presses to apply the minimum effective amount of water in the printing process through a three-roll system. By minimizing the amount of water on the printed surface, Dahlgren dampeners reduce drying time, improve clarity and preserve an effective ink/water balance.

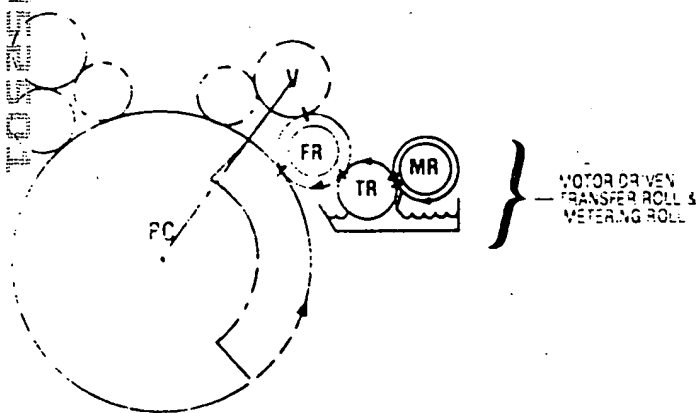
Specific benefits of the Three (3) Roll are:
-Precise, uniform water control.

- Stronger colors/uniform color
- Cleaner reverses
- Sharper halftones
- Faster start-up and wash-up
- Immediate response
- Less spray Powder (sheet fed presses)
- Faster drying
- Low maintenance
- Operational Ease
- Less ink and water use
- "Up to Color" quickly
- "Finger-tip" control of ink/water balance



DAHLGREN THREE ROLL DRIVE

See schematic diagram shown below.



DAHLGREN THREE ROLL DRIVE

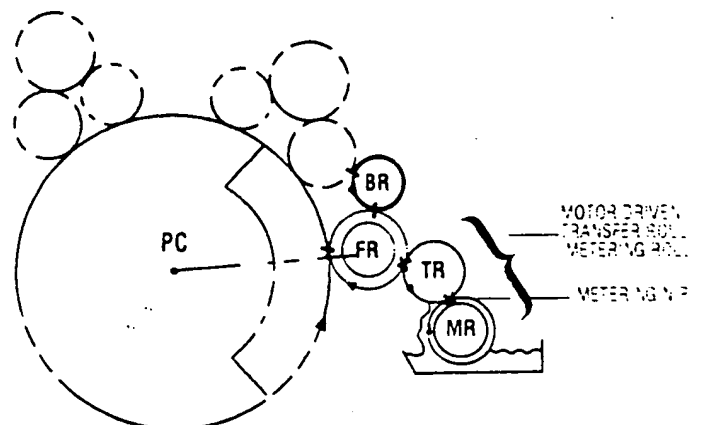
Schematic description:

The Dahlgren system of dampening is accomplished with two basic designs. In both designs fountain solution is lifted from the water pan and is conveyed to a point between the Metering Roll and the Transfer Roll. At this point high pressure meters the fountain solution into a thin uniform film. As the

rotating surface of the film splits — for the first time — into two thinner films. One film remains on the Metering Roll surface and returns to the water pan. The other film is conveyed on the surface of the Transfer Roll to the contact point between the Transfer Roll and the Form Roll where the film splits for the second time. —One film remains on the Transfer Roll and returns to the water pan. The other film bonds with the ink film on the Form Roll and is conveyed to the contact point between the Form Roll and the Plate Cylinder. It is here that both dampening fluid and a full charge of ink are imparted to the plate for printing. After the metering roll has been accurately set, speed differential between the hydrophilic chrome Transfer Roll and the Form Roll is the only control needed for any plate design or sheet size.

Schematic and Description: Dahlgren Four (4) Roll with Differential Drive

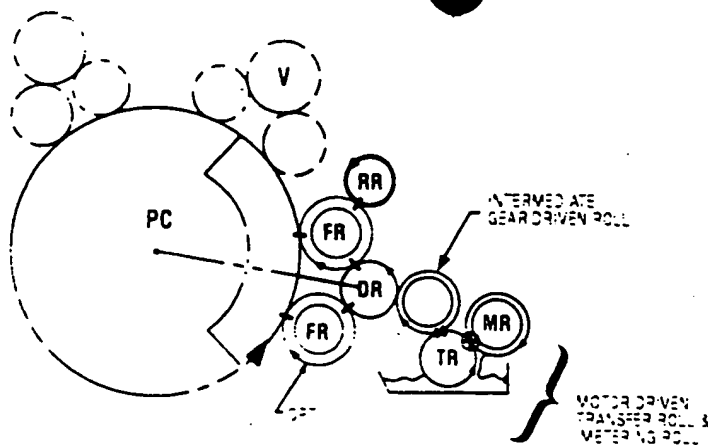
The Dahlgren Four-Roll system primarily for sheet-fed press applications, provides differential drive control at three strategic nips: between the metering roll and transfer roll, the transfer roll and form roll, and between the form roll and the plate. This design incorporates a self-oscillating idler roll that connects the dampening form roll to the first ink form roll on the press, for a more even application of ink. While this is the basic Dahlgren four-roll design, variations can be achieved for a custom fit on any press.



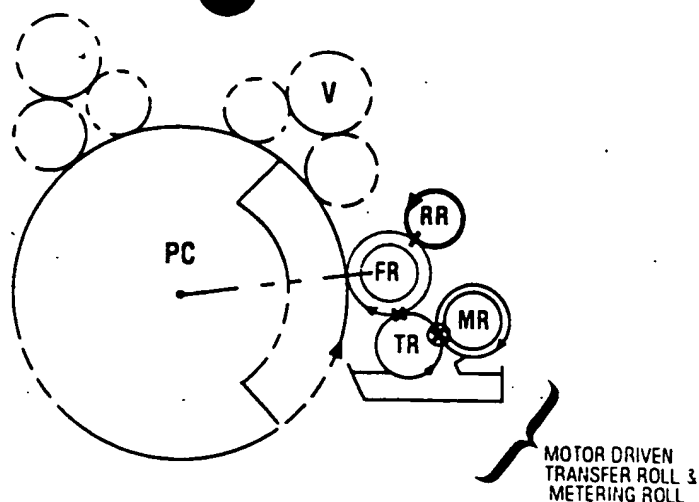
DAHLGREN FOUR ROLL DIFFERENTIAL DRIVE

Additional benefits of the four (4) roll differential drive dampener are:

- Print heavy and smooth solids



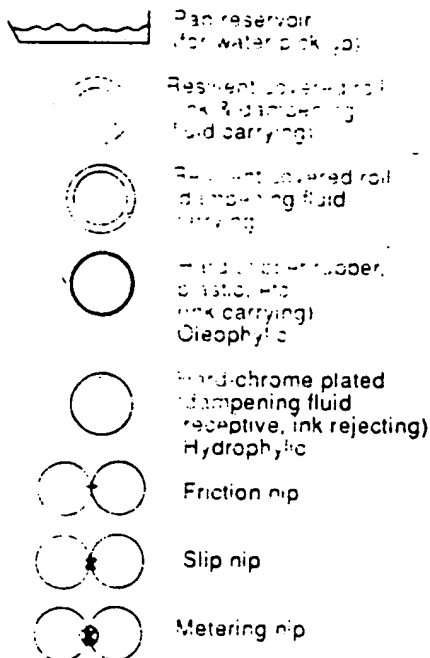
O.M.C.S.A.
(POLI - FLO)



ROLAND - MIEHLE
(MIEHLE - MATIC*)

LEGEND:

- Phantom lines (press)
 Solid lines (dampener)
 V = Ink Vibrator (press oscillator)
 PC = Press Plate Cylinder
 • Drive from press to dampener
 approx. = plate speed



FR = Dampening Form Roll

RR = Rider Roll; BR = Bridge Roll
 (each may oscillate,
 RR may be optional)

DR = Distribution Roll (Osc.)

TR = Transfer Roll

MR = Metering Roll

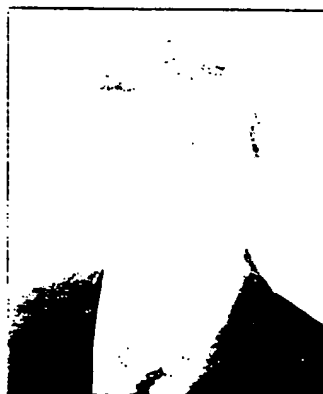
(NOT TO SCALE)

* THIS DAMPNER WAS LICENSED TO THE MIEHLE CO.
 BY DAHLGREN MFG. CO. IN THE 60'S & 70'S.

As one can readily see, there are many varied configurations of continuous-duty dampeners, and while all appear to achieve the intended purpose, some work better than others. I guess there's more than one way to skin a cat.

However, many still wonder to whom Mr. Dahlgren was referring when he boldly said, that he could "count on one hand those who really understand the principles and intricacies of lithography and the dampening process." But, then again, he was a bold man!

James E. Taylor, is presently O.E.M. & Technical Sales Manager for DAHLGREN USA, Inc.. Mr. Taylor previously served as Vice-President, Research & Development of Dahlgren International, Inc.. He has been with the corporation for 27 years.



DAHLGREN

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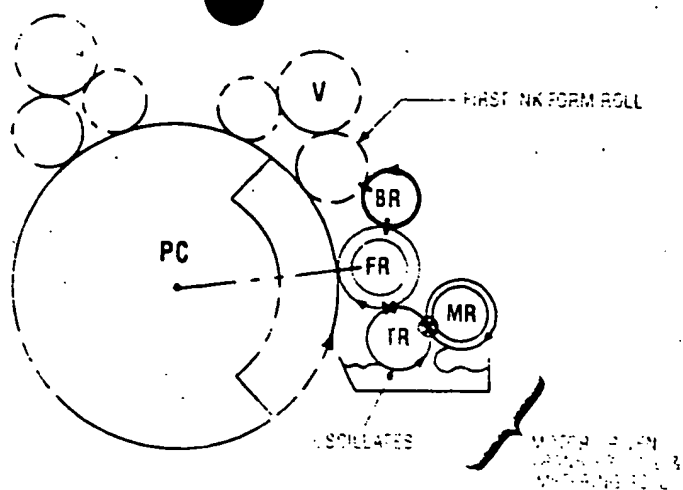
Portions of this article were previously published in the Nov/Dec 1990 issue of *Graphic Arts Product News*

• Less posting

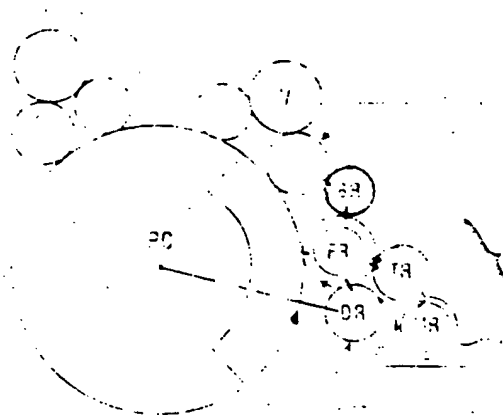
The Dahlgren Four-Roll system of dampening is accomplished primarily with one roll design. In this design, fountain solution is picked up by the Metering Roll and is conveyed to a point between the Metering Roll and Transfer Roll. At this point, pressure meters the fountain solution into a thin uniform finite quantity. As the rotating surfaces part, the quantity shears and divides—for the first time—into two thin films. One film remains on the Metering Roll surface and returns to the pan. The other film is picked up on the surface of the Transfer Roll and is carried to the print.

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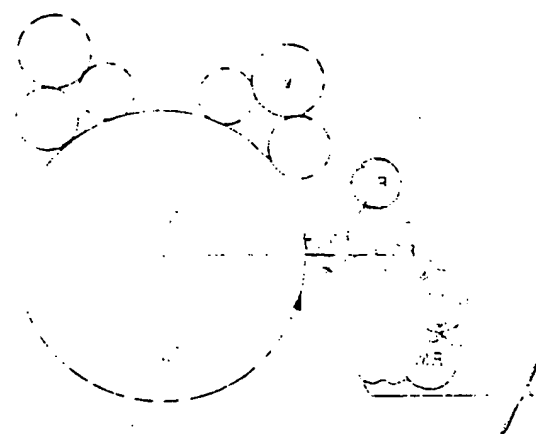
Other Continuous Duty Dampeners

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MAN - MILLER
(ALCOTRON)



FEIDELBERG
ALCOLOR III)



MAN - ROLAND
(ROLAND-MATIC)

HARRIS, SIMLAK, & HANCOCK
2000

ALL INFORMATION CONTAINED
HEREIN IS UNCLASSIFIED

[illegible]

-1-

094596 094596

<u>Drawing No.</u>	<u>Date of Drawing</u>
PRI 00012	12/30/94
PRI 000675	1/27/95
PRI 00670	2/14/95
PRI 01143	2/15/95
PRI 01144	2/15/95
PRI 01158 - PRI 01159	2/18/95
PRI 01166 - PRI 01167	2/23/95
PRI 01160 - PRI 01161	2/25/95
PRI 01172 - PRI 011773	2/25/95
PRI 01163 - PRI 01165	3/6/95
PRI 01168	3/9/95
PRI 01169	3/9/95
PRI 01162	3/10/95
PRI 01174 - PRI 01175	3/10/95
PRI 01170 - PRI 01171	3/14/95
PRI 01176	4/19/95
PRI 01177 - PRI 01178	4/25/95
PRI 01350	8/4/95
PRI 01352	8/18/95
PRI 01351	8/22/95
PRI 01353	9/14/95
PRI 01359	10/4/95
PRI 01354	10/19/95
PRI 01355 - PRI 01356	10/26/95
PRI 01357 - PRI 01358	11/1/95
PRI 01360	11/21/95
PRI 01361	11/26/95

Drawing No.

PRI 01362

PRI 00059

PRI 00684

PRI 00686

Date of Drawing

11/30/95

Not Dated or Unclear

12/27/94

Not Dated or Unclear

09315796.052504

BROCHURE INDEX

<u>Tab No.</u>	<u>Description</u>	
1	Dahlgren Coater Dampener	1978
2	Dahlgren - Dampener Division	Copyrighted 1981
3	IBC Blanket Coating System	1984
4	Dahlgren Coater Printer	1986
5	Dahlgren Presentation visuelle	1987
6	Oxy-Dry 2 Roll Blanket Coater	1987
7	Dahlgren - Product Data Dahlgren Blanket Coater	Approx. 1988+
8	Pictures of Rapidac Blanket Coater	Late 80's or early 90's
9	Dahlgren Product Data Bulletin	Approx. 1990
10	Dahlgrens New Lithoplus Coating System	Dated 1990
11	Dahlgren Lithoplus Coater	Dated 1990
12	Epic 3 Roll Coaters (Ctr./Dampener, Blanket and Web)	1991
13	PRI's PBC Plate/Blanket and PC Plate Coater	Early 1990s
14	Dahlgren Single Roll Coater	Approx. 1992
15	IVT Colordry, Inc. Blanket Coater	Est. early 90's
16	Dahlgren - The Greatest Performance In Printing	Early 90's
17	Dahlgren LithoPlus Coater	1995

Retraction System Designs

18	Retraction System Designs by James E. Taylor and D.R. Selby	1984-1985
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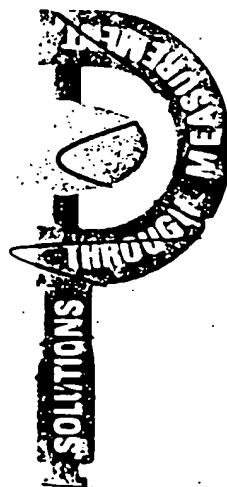
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**The Versatile
Two in One**

REGISTERED

DAHL-GIRZEN[®] Coater-Dampener

FINGERTIP CONTROL
IMMEDIATE RESPONSE
CONTINUOUS-DUTY OPERATION
PRECISION LATERAL CONTROL
SIMPLICITY IN MECHANICS & SETTING



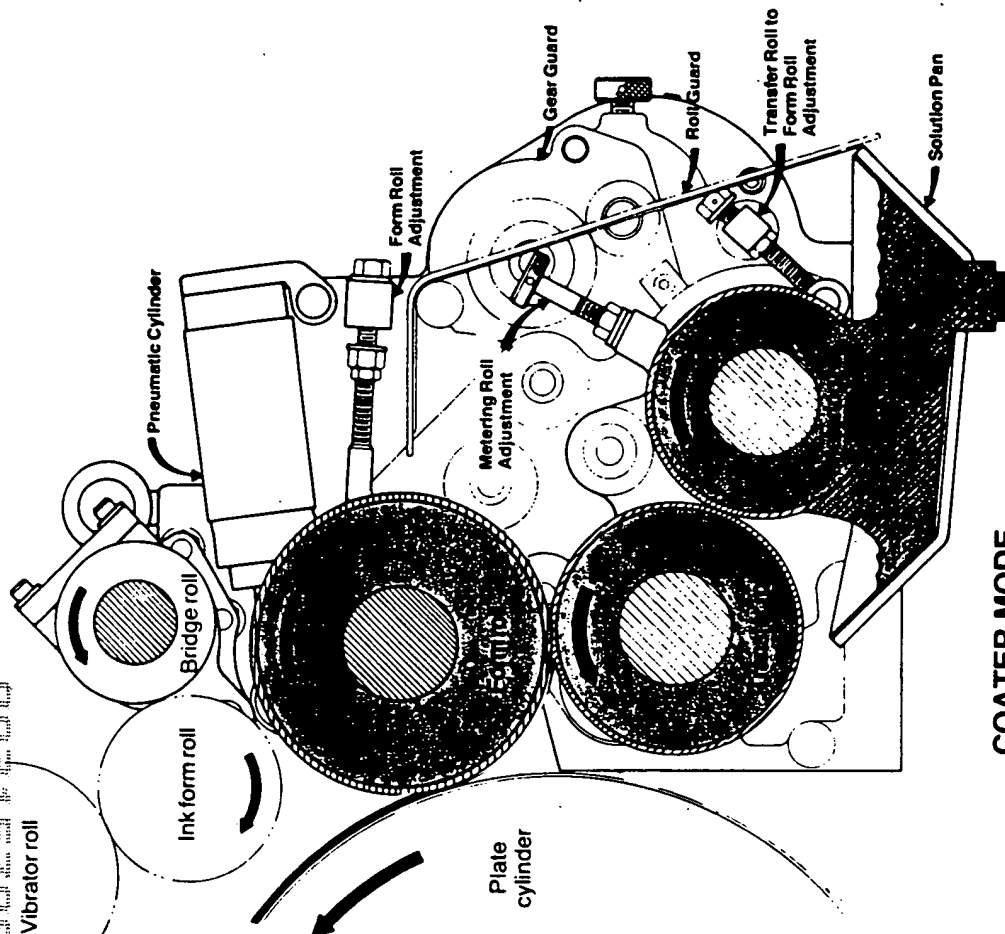
598210W

Model 3625TF60

Vibrator roll

DAHLGRENCoating System

The Dahlgren converts from a dampener to a coater in a matter of minutes. You need only choose the mode of operation. In the coater mode of operation the bridge roll is pulled away from the ink form roll. This allows the DAHLGREN® form roll to deposit a metered amount of acrylic coating solution to the entire surface.

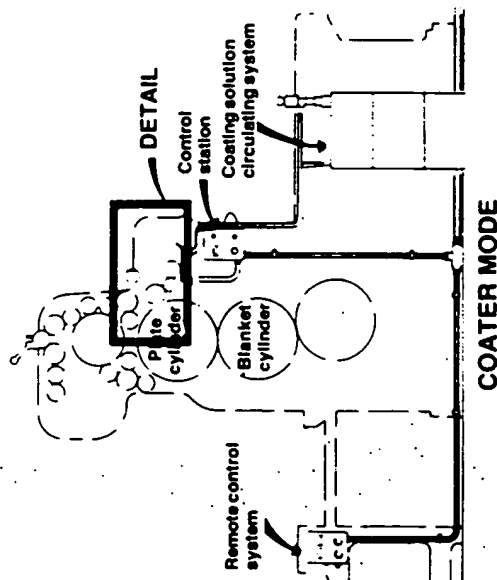


COATER MODE

DETAIL

LEGEND

- Coating Solution
- Press
- Dahlgren Equipment



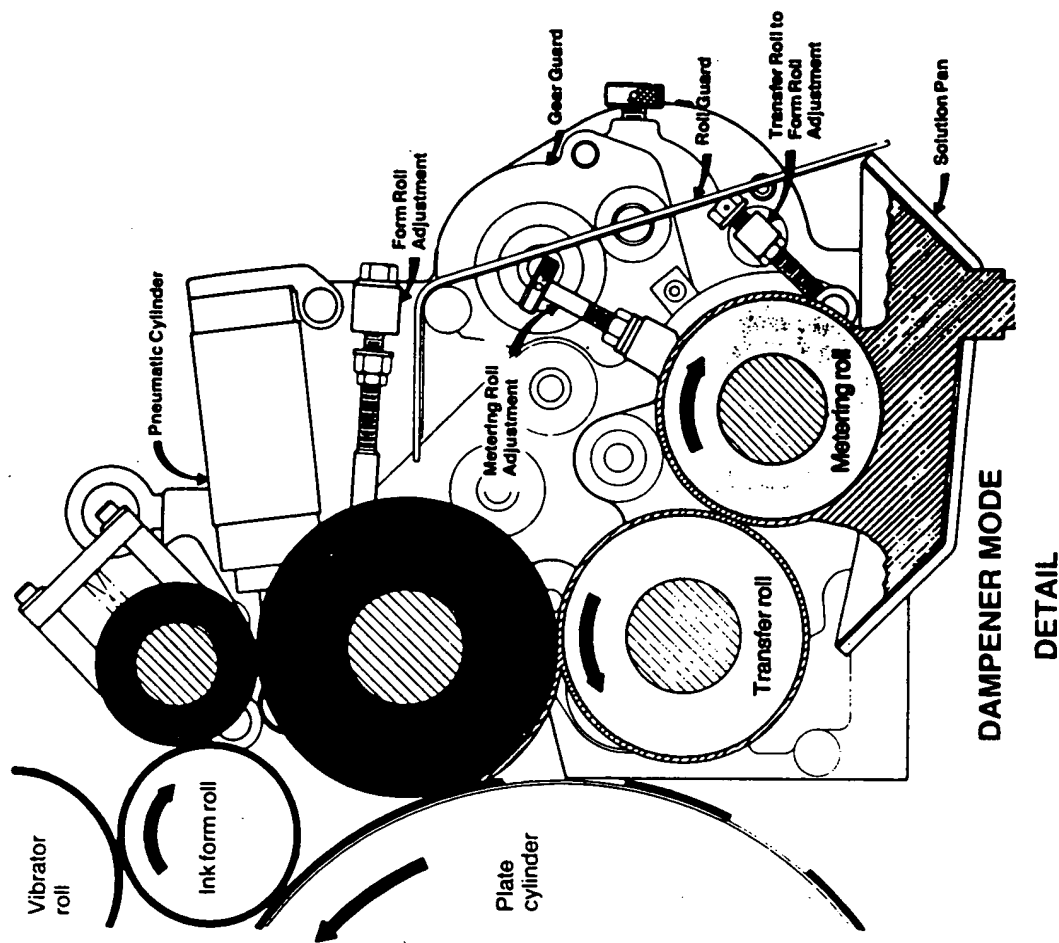
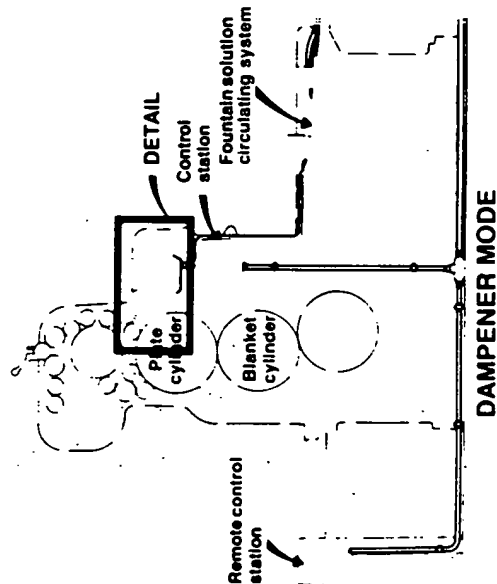
COATER MODE

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W018870

DAHLGREN Dampening System

The DAHLGREN® converts from a coater to a dampener in minutes. You need only choose the mode of operation desired. In the dampener mode of operation there is an extra inking form roll running against the plate cylinder.



LEGEND
 ■ Ink
 □ Fountain Solution
 — Press
 — Dahlgren Equipment

DAHLGREN Mfg. Co. 1978
all rights reserved.

W018871

- 100% elimination of offset spray powders... a full color run.
- Housekeeping problems related to the usage of offset spray powder are ended forever for the packaging manufacturer, the label printer and most lithographers in general. There is no longer any reason for spray powders to dust off in the finished product line.
- The aesthetic appearance of sheets coated by the DAHLGREN® Coater-Dampener using an acrylic coating is dramatically enhanced. The rough gritty texture of conventional varnish-spray powder finishes are replaced by a noticeably smoother surface. The reason is quite apparent under an electron microscope, as it reveals all the 'peaks and valleys' created by varnish-offset spray methods of coating, while the acrylic coating applied with the DAHLGREN® Coater-Dampener is nearly smooth, except for the sheet grain and texture.
- Visual appeal of coated sheets is also improved, as no unsightly layer of offset spray powder appears on the surface of the product to detract from the optical values of the finish.
- The Coater-Dampener eliminates the wasted floor space that used to be taken up with drying skids for boards and sheets coated in the old-fashioned way with varnishes and offset spray powders.
- The same machines, set-ups and stacking procedures may be utilized as before for cartons and/or sheets.
- The need to leave glue flaps uncoated as with conventional coating methods is eliminated with the DAHLGREN® Coater-Dampener.
- In line coating is now a reality, thanks to the DAHLGREN® System. Subsequent finishing operations can now be performed within a matter of hours after the coating is applied.

Printed by Intenso Offset BV, Amsterdam, with Dahlgren Dampening System

DAHLGREN® Company reveals the following:

These test panels were found to contain no dust due to the coating. Nor was there any odor absorbed by the client's product itself. There is, however, a slight aroma on a freshly coated sheet that dissipates as the coating dries.

Stain Resistance

Coatings are quite resistant to soiling by fingerprints or other oily base substances. The paper, however, may come into contact with a liquid or oil, which for a short term as can be expected in normal handling.

Blocking

The coating will not block at normal or elevated temperatures typical of those encountered in warehousing or shipping.

Stain Resistance

Coatings will withstand normal, short-term staining. The staining may be experienced when the paper is in a laundry, without serious staining. The coefficient of friction measurement indicates a 17 to 18 degree slide angle.

Stamping Acceptance

The coating will accept price stamping without delay after its application, with no smearing or wipe-off after only 20 seconds of drying time.

DAHLGREN

MANUFACTURING COMPANY

3305 Manor Way, Dallas, Texas 75235
in Texas and Canada tel (214) 357-4621
Toll Free 800-527-4684
Telex 73-0329 Dahlgren Dal

1-19-3 Nishi-Shimbashi
Minato-Ku
Tokyo - Japan
Tel. (03) 501-1301
Telex 02225441

172 Sierrabeekstraat
B-1930 Zaventem Zuid 7
Belgium
Tel (02) 721 29 14 (3L)
Telex 25604 Dahlby B

DAHLGREN®

DAMPENER DIVISION

World Leader for more than twenty years in Graphic Arts Technology and Equipment

- **HIGH PERFORMANCE PUBLICATION WEB DAMPENERS**
- **DAMPENING SYSTEMS**
- **COATER-DAMPENING SYSTEMS**
- **LIQUID APPLICATION SYSTEMS**

Products are custom designed and manufactured to meet the customers needs.

WORLD WIDE PERFORMANCE AND SERVICE WARRANTY

Domestic and Foreign Patents
Issued and/or Pending.

**FOR FURTHER INFORMATION
WRITE OR CALL**

DAHLGREN®

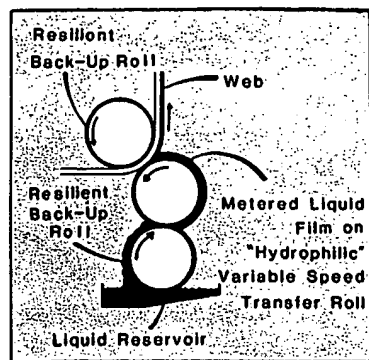
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3305 MANOR WAY, DALLAS, TEXAS 75235
IN TEXAS and CANADA TEL. (214) 357-4621
TOLL FREE 800-527-5301
TELEX 73-0329 DAHLGREN DAL

STERREBEEKSTRAAT 172
B-1930 ZAVENTEM-ZUID 7
(BRUSSELS), BELGIUM
TEL: 721-29-14
TELEX: 25-604 DAHLBR B

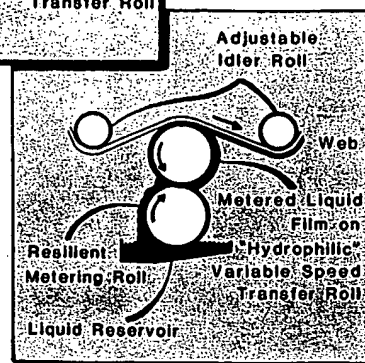
No. 2 FUTABA BLDG.
19-3 NISHI-SHIMBASHI
1-CHOME MINATO-KU
TOKYO, JAPAN
TELEX: 781/2225441

Liquid Application System (LAS®)



Coating Application

Moisturizing Application



Capabilities of the Dahlgren Liquid Application System

The system can apply a broad range of aqueous and non aqueous coatings at previously unachievable light functional coat weights. It maintains constant linear thickness throughout its entire speed range. When changing web speeds it is not necessary to adjust the viscosity of the coating solution. Varying web widths can be run on the same unit without encountering edge build-up.

Control of the applied coat weight is within .1%. Also, the system offers better control of the penetration of materials and coat weight remains the same regardless of sheet variations.

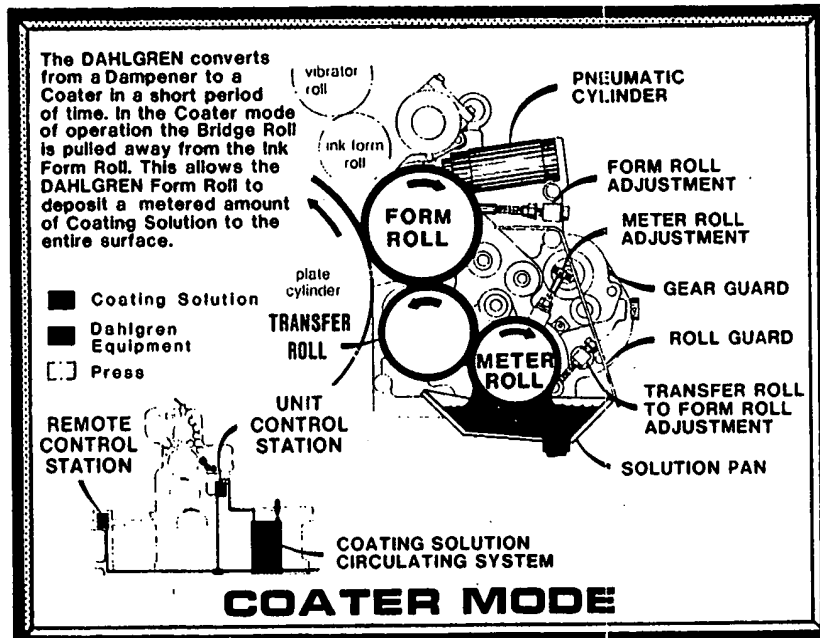
Changing from one coating material to another is a fast and simple operation. Training operators is easy compared to the training required for other coating equipment.

The Dahlgren Liquid Application System can be applied to many paper-making and converting functions — such as moisture profiling, decurling, surface coating, controlled penetration coating, high solid starch applications and other difficult and costly operations.

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W018874

Coater-Dampener System



- 100% elimination of offset spray powders on a full color run.
- Housekeeping problems related to the usage of offset spray powder are ended forever for the packaging manufacturer, the label printer and most lithographers in general. There is no longer any reason for spray powders to dust off in the finished product line.
- Visual appeal of coated sheets is also improved, as no unsightly layer of offset spray powder appears on the surface of the product to detract from the optical values of the finish.
- The COATER-DAMPENER eliminates the wasted floor space that used to be taken up with drying skids for boards and sheets coated in the old-fashioned way with varnishes and offset spray powders.
- The same machines, set-ups and stacking procedures may be utilized as before for cartons and/or sheets.

Characteristics of the acrylic coating as applied by the

DAHLGREN Coater-Dampener . . .

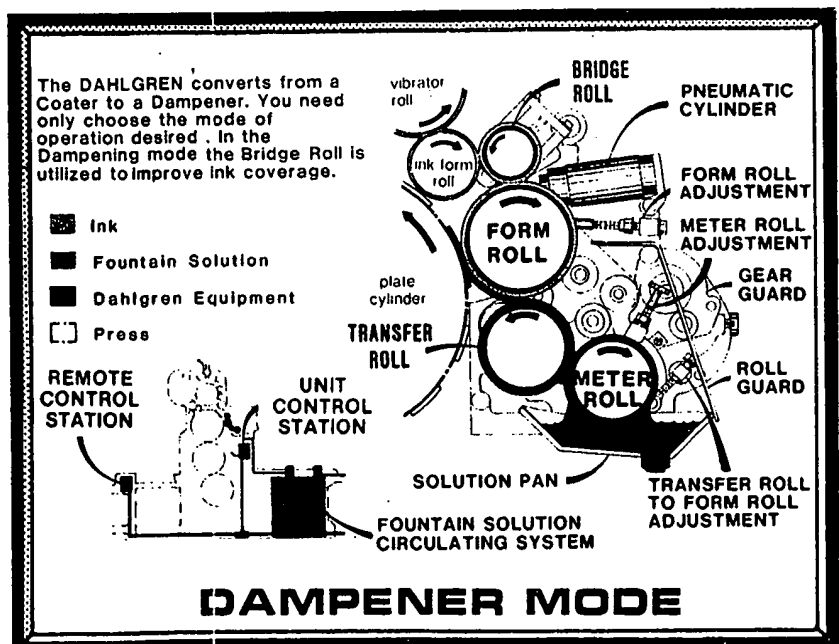
Gloss

Acrylic coatings applied with the COATER-DAMPENER will meet or exceed meter tests for varnishes of the same thickness

Coatings applied by the DAHLGREN SYSTEM provide superior glue-ability, even though applied over the entire sheet. 100% fiber tear is experienced with water based adhesives or hot melts. This proves the adhesive bond is stronger than the paper substrate itself. Conventional varnish or spray powder finishes must be applied only over the printed area as they have a negative effect on glueability.

COATER-DAMPENER applied acrylic coatings do not yellow when exposed to ultraviolet of sunlight, while conventional varnishes are quite susceptible to yellowing.

In bending test, the acrylic coating did not crack on scored lines when the paper product was folded and set-up.



IBC
Blanket Coating
System



W018877

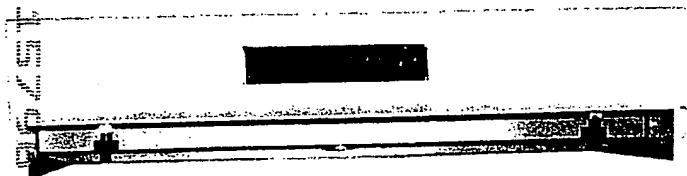
When you want the full-line on in-line, talk to IBC.

We urge you to look closely into a "first." The IBC Blanket Coating System. It is the first blanket coating system to efficiently apply today's coatings *in-line*.

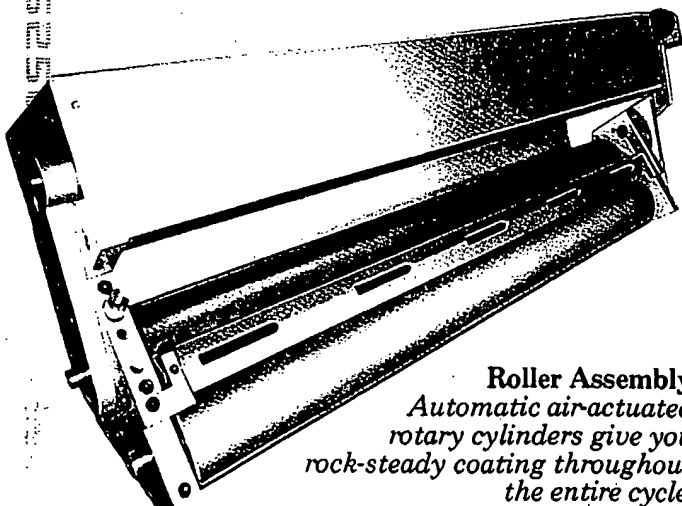
Its major components consist of a blanket coater with recirculating tank and a shortwave infrared dryer. It adapts to almost any sheetfed press, any make, in any size from 18 to 77 inches.

It is also the only in-line system with a retractor unit. The retractor lets you automatically change from printing to coating, and vice versa, in a matter of minutes.

The IBC System is a real timesaver in several ways. No plate mounting is ever called for, which of course means no plate washing on trip-offs either. Thirty-minute make-readies are the rule, not the exception. And the IBC System comes with its own blanket washer that can be manually operated to wet the blanket; or it can be set to automatically wash the blanket on trip-offs - again saving you time.

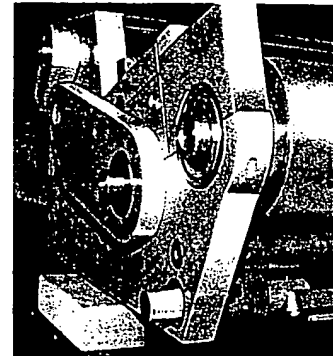
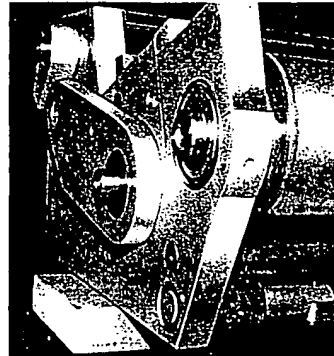


Coater Unit. Easily retracts from the press and re-connects with all settings fully retained.

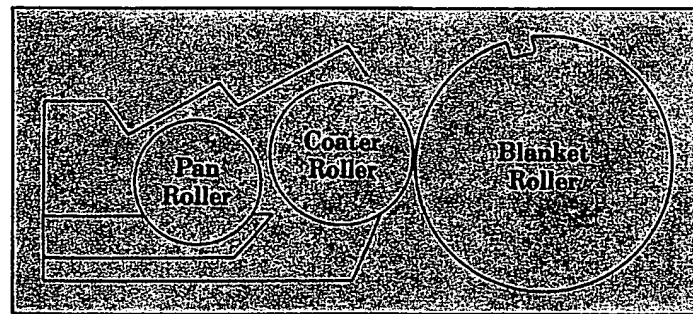


Roller Assembly. Automatic air-actuated rotary cylinders give you rock-steady coating throughout the entire cycle.

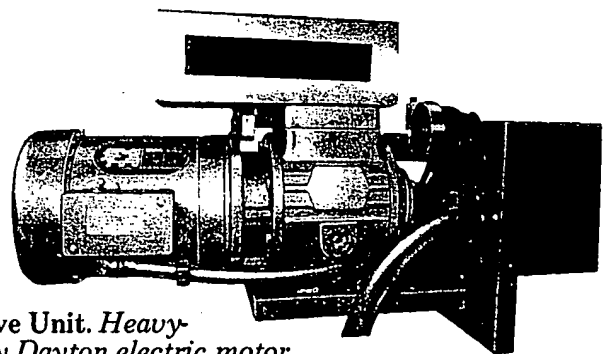
The IBC System's coater roller (composed of a harder-than-steel ceramic material) is driven by a variable-speed, constant-torque transmission. It allows you to run the coater roller up to 25% slower than the blanket cylinder. Any ridging is eliminated. You get a super smooth coating.



Easy Operation. Automatic air actuated engages the coater unit to the press. Photo at left shows pins disengaged.

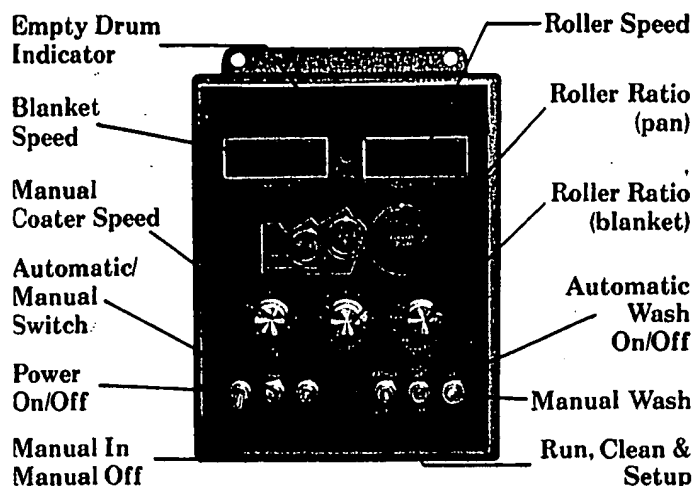


Simple Mechanics. Once the press is tripped, the coater automatically withdraws and goes into an idle mode keeping the rollers wet.



Drive Unit. Heavy-duty Dayton electric motor is coupled with a durable, high torque transmission.

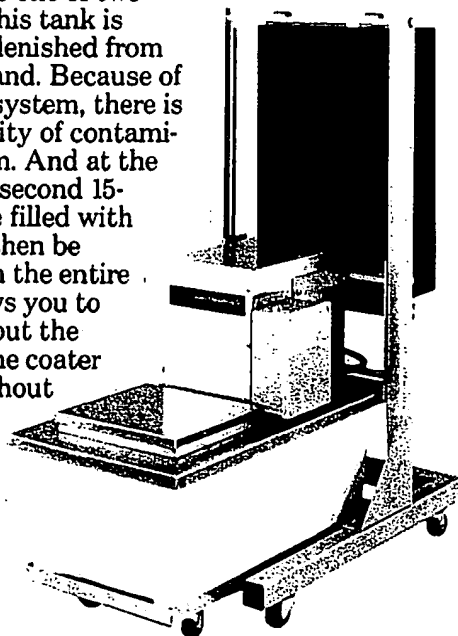
Constant operating speeds are maintained by the heavy-duty Dayton electric motor. And you get positive power through all speed ranges, because the motor is directly linked to the high-torque transmission. No DC belt-drive, like on most other coaters. All you do is set up the initial roller speed from the control panel, and then fine-tune as you run. Faster, slower, whatever speed you set, the coater will follow automatically.



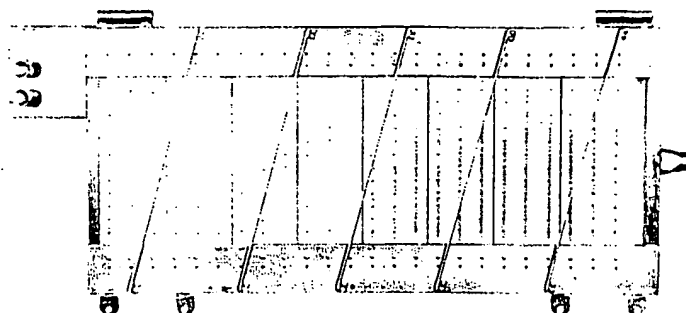
Control Panel. Gives you infinite speed control and two wash-up options.

Easy-to-read LCD displays on the control panel tell you how fast the coater roller and blanket cylinder are running. Also, the control panel is easy-to-reach, conveniently located on the operators side of the press at the coater position.

The IBC System is also equipped with a recirculating tank unit. It is this component of the system that continuously replenishes the coater via flexible plastic hoses connected to one of two 15-gallon tanks. This tank is automatically replenished from the drum on demand. Because of this replenishing system, there is never any possibility of contamination to the drum. And at the end of each run, a second 15-gallon tank can be filled with water, which can then be circulated through the entire system. This allows you to thoroughly flush out the recirculator and the coater automatically without ever having to change the solution in the first tank.

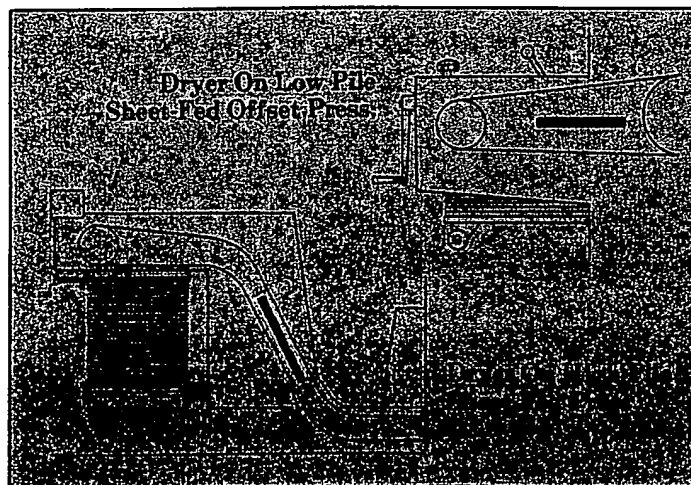


Recirculating Tank Unit. Sets on wheels, so you can place it anywhere near the coater and still keep it out of the way.



Infrared Dryer. Safe, shortwave infrared energy is emitted from high-efficiency, low-mass, tubular quartz lamps.

All IBC Infrared Dryers are custom-designed to fit specific presses for specific applications. Consequently, an IBC dryer can be installed on virtually all high-pile or low-pile sheetfed offset presses. No major press modifications are ever needed.



IBC Dryers, installed. The IBC Infrared Dryer can be mounted parallel to the direction of sheet travel, between the gripper chains.

Because of the lamps low mass, they reach operating temperature almost immediately and cool down equally as fast. Whenever the IBC dryer is on, an air supply system delivers a flow of cooling air across the lamp terminals to keep them cool. A thermostat inside the dryer's frame monitors the temperature and automatically shuts off the dryer if the temperature (for whatever reason) rises too high. Each IBC dryer comes with an air knife bar for drying aqueous coatings. Optional dryer equipment includes a water-cooled reflection pan and sheet cleaners for some presses.

Aquacoat™ Water-Based Coating

Bring high-gloss beauty to your printing with Aquacoat™ water-based coating.

It gives paper and paperboard a good moisture-barrier, high grease-resistance and superior rub characteristics. Yet, it has no effect on the important paper qualities, such as color, strength or flexibility. And it is also bio-degradeable.

Aquacoat coating is permanent and fast drying. Apply it wet-on-wet, or on dry ink. It is also glueable, imprintable, and can be price marked.

Aquacoat coating keeps packages clean and protects them from

abrasion through finishing, packing, shipping, storage - all the way to the point-of-purchase. And even while the customer uses it, the product stays clean and fresh-looking.

Use Aquacoat water-based coating for cartons, trays, bags, labels, coupons, wraps, laminates, brochures and covers.

If you'd like to know more about Aquacoat coating or our full-line of in-line blanket coating components, please call us.

We'd be happy to hear from you.

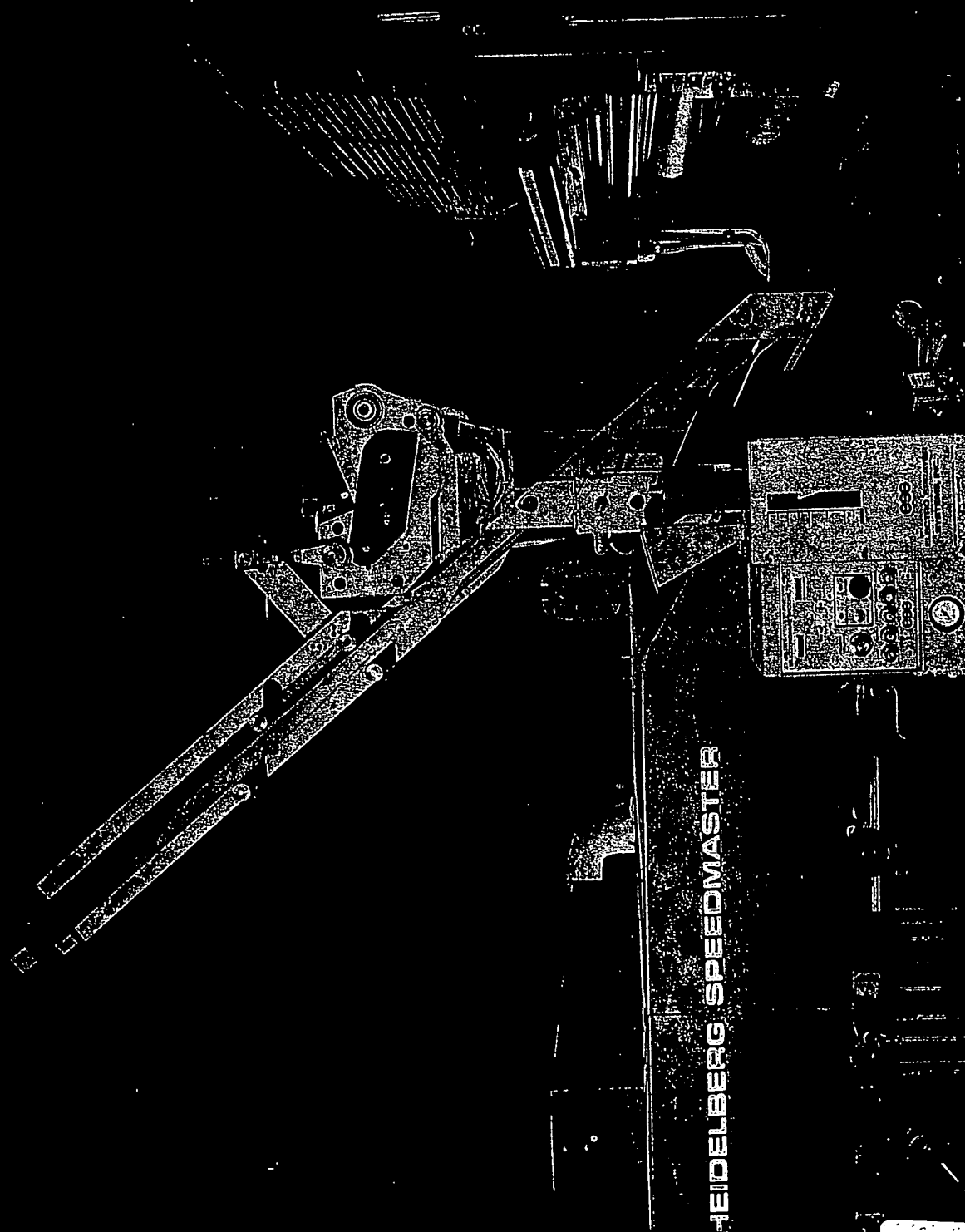


INTERNATIONAL BLENDING CORPORATION

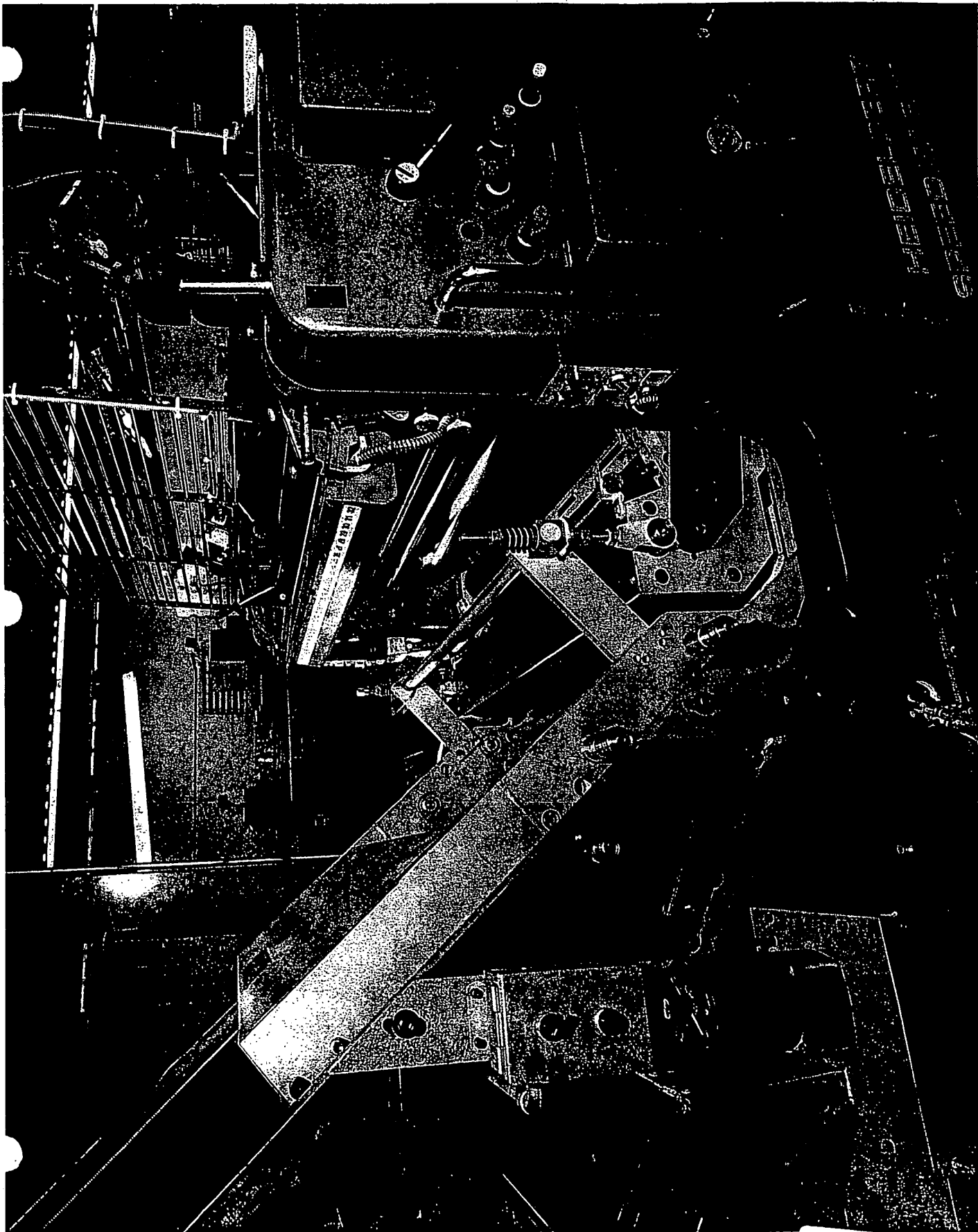
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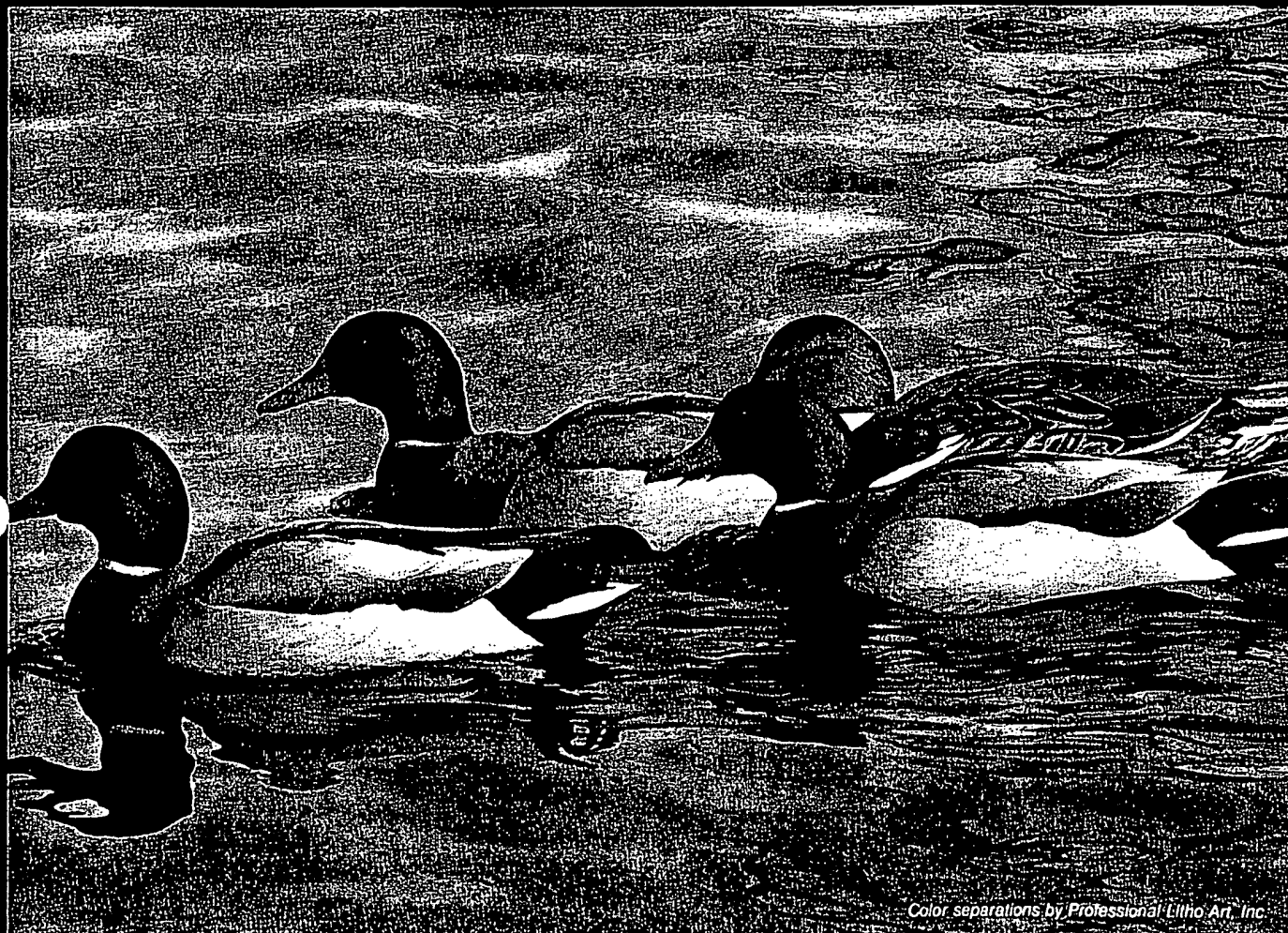
HEIDELBERG
SPEEDMASTER



W018881



W018882



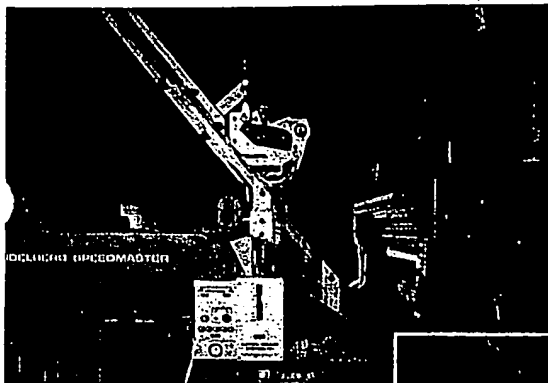
**What you see is beautifully protected by Aquacoat.™
To see how it was applied in-line, just turn the page.**

Artist: Tom Gross, "Mating Mallards"

Ask for details on how you can receive a signed proof of this
award winning art, "Mating Mallards".



W018883



Come to IBC— the Coating Systems People.

The IBC/Ryco Graphic In-Line Blanket Coater

IBC/Ryco Graphic is the first—the first blanket coating system to efficiently apply today's coatings *in-line*.

You can install the IBC system on almost any press, any make, from 18 to 77 inches. When you're not coating, simply retract the coater for easy access to the blanket cylinder.

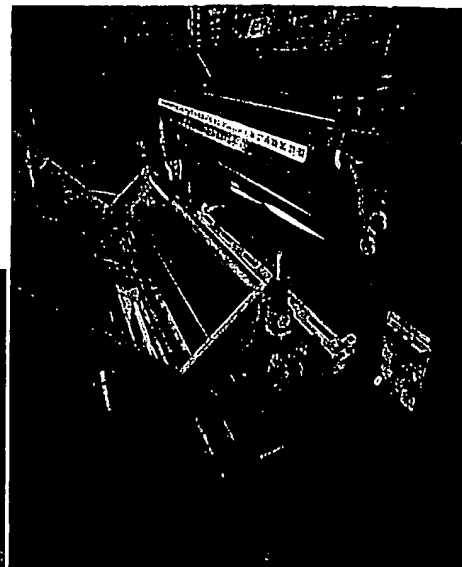
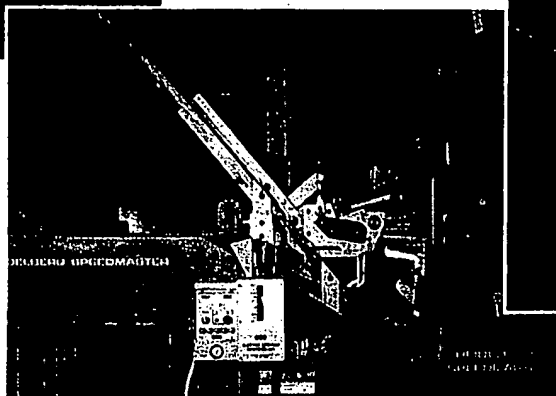
The independently driven pan roller and coater roller can be fine tuned to run faster, slower, or the same speed as the blanket cylinder. An LED display tells you how fast the coater roller is running; once it's set, the coater will always follow press speed.

A 15-gal. recirculating tank continuously replenishes the coater. Because the tank unit sets on wheels, you can place it anywhere near the coater and still keep it out of the way. In fact, you get an extra tank with the system, so you can flush out the press and the system without changing solution in your coating tank. (Its low profile lets you mount the coater on any high-low offset press.)

No plate mounting is necessary with the in-line IBC/Ryco—in fact, ten-minute make-readies make the IBC/Ryco Graphic Blanket Coater a real time saver compared to others. It comes with its own blanket washer that automatically washes the blanket on trip-offs—again saving you time.

IBC Infrared Drying Equipment

The IBC Dryers are manufactured to exacting engineering specifications to perform well with the IBC Coating System. The dryer comes equipped with an air knife bar necessary for drying aqueous coatings. The IBC Dryer uses air cooling and thermostats to protect both the dryer and the press it's mounted on. IBC offers a water cooled reflection pan if desired. IBC also offers sheet cleaners for some presses.



Aquacoat™ Water-Based Coating

You can bring high-gloss beauty to your printing with Aquacoat™.

Aquacoat™ gives paper and paperboard a good moisture-barrier, high grease resistance, superior rub characteristics and is non-yellowing. Yet, it has no effect on the important paper qualities of color, strength or flexibility.

Aquacoat™ is permanent and fast-drying—apply it wet-on-wet or on dry ink. It's also glueable, imprintable and can be price marked. Uses include cartons, trays, bags, labels, coupons, wraps, laminates, brochure and covers.

Aquacoat™ keeps packages clean and protects them from abrasion through finishing, packing, shipment, storage, all the way to the point-of-purchase. And even while the customer uses it, the product stays clean and fresh-looking.

Yes, tell me more!

Send me more information about the:

- ☐ Aquacoat™ Water-Based Coating
- ☐ Ryco In-Line Graphic Blanket Coater
- ☐ IBC Dryer
- ☐ I am interested in the total IBC System.
- ☐ Please have your sales representative call me.

Name _____ Title _____
 Company _____
 Address _____
 City _____ State _____ Zip _____
 Phone _____
 Press Size _____

Write to:

International Blending Corporation



8090 Ranchers Road
 Minneapolis, MN 55437
 Phone: 612/780-5377

W018884

*Henry
Taylor*

RYCO GRAPHIC MANUFACTURING, INC.

ROLLER COATER

SET-UP PROCEDURE

20250300-20250300

W018885

COATER
SET-UP PROCEDURE

- 1) Put coater rack in down position & lock by pushing.
- 2) Push down button, making sure coater air cylinder rods clear coater safety rack.
- 3) Be sure coater sets on wheels when contacting rails. First release front hoist hooks & move up out of way. Lower coater more until back hooks are free. Hold back hooks away and put hoist up at top. Hold up button until hoist stops.
- 4) Push coater into press: both sides equally. Be sure air cylinder shafts contact top 2" diameter bar. Put top of clamp blocks on. Reach under coater with tool & lock pins into frame brackets. Tighten clamp blocks by turning screws and drawing air shaft rods up. (Placing control on manual & set-up, then pushing & holding out switch will aid in tightening clamps.)
NOTE: *** Keep fingers clear when holding switch!!!
- 5) Put stand tube in pan, drum fill tube in drum, and return from recirculator in recirculator. Open lid. Turn green switch on to start recirculator.
NOTE: *** Power switch on coater control must be on and also run switch must be in set-up position.
Open fill valve on supply tube at coater.
- 6) When coating is flowing into drain in pan, put control from set-up into run position.
- 7) Adjust pan roller screw counter-clockwise evenly on both sides until coating on main roller is very thin but wet.
- 8) Put unit of press with coater on impression.
NOTE: Make sure coater control is switched to manual position before moving press.
- 9) NOTE: When packing blanket, be sure packing is cut to just inside sheet, about 1/8" each side.
- 10) Stripe blanket by setting run switch first to set-up and wait until roller stops. Then move in/out switch to in & hold for a second. Then release and hold out, release. Then return to run position. Move blanket cylinder around to inspect stripe.
- 11) If stripe is about 1/4" wide & wet all across, then run about 25 test sheets with press running slow. (see running)
IF STRIPE IS: REMEDY
- | | |
|---|---|
| NOT SEEN
(See Stop Block Adjustment) | Back out stop block adjustment (1) turn at a time, both sides equally. |
| HEAVY ONE SIDE (1/2" WIDE)
NOT SEEN ON OTHER SIDE
(See Stop Block Adjustment) | Back adjustment <u>out</u> on side with <u>no coating</u> and put (2) turns <u>in</u> on other. |

IF STRIPE IS:

REMEDY:

1/2" WIDE ALL ACROSS
(See Stop Block Adjustment)

Turn adjustment screws in (2) turns, both sides equally. (See Run)

- 12) Stop Block Adjustment:
Loosen top allen screw. Then turn large bolt in (clockwise) or out, depending on condition.
NOTE: Before re-testing, top allen screw must be very tight.
Each full turn of large bolt equals .010 of an inch movement of coater to blanket contact.
- 13) Running:
NOTE: When testing, take press unit off impression before putting coater control on Auto for Running.
- 14) When running, put coater roller #1 knob (center knob) at (1) at right of zero (0) to start. Set pan roller on (2) to keep coating circulation in NIP.
- 15) NOTE: Turn control knob for roller #1 (center knob) up to (2) or (3) if more coating is desired or gripper edge of sheet coating looks dragged or scuffed, about 1/4" back all across.
- 16) Clean-Up:
Pull stand pipe out, turn valve on fill tube off, take fill pipe out of coating from coating barrel, and return hose from recirculator. Put into coating drum. Then open grey valve.
- 17) VERY IMPORTANT:
Turn control for coater to clean position and immediately wet both coater rollers. Turn pan roller screws clockwise to back roller, away from main roller, about 6 turns, evenly both sides. With wet folded cloths, wipe full length very fast to pick-up any excess coating still on rollers.
- 18) VERY IMPORTANT:
Through entire clean-up, keep grey roller end plates wet with water (side against rollers), thus cleaning without removal.
- 19) Push whatever coating left in pan toward drain.
- 20) When recirculator has pumped all but about 1" of coating out of tub back into drum, remove tub and clean. Replace second tub with water--no more than 1/2 full.
- 21) VERY IMPORTANT:
Remove hose and barrel tube from drum and put into open lid in recirculator. Turn green switch on and let water pump through hoses for a couple of minutes. Turn grey valve off on recirculator hose. This will pump water up to the coater when supply tube valve on coater is opened.

22) VERY IMPORTANT:
Wash excess coating off everything with this water very completely. Then repeat this procedure with (2) more tubs of water. On last tub, turn valves off and leave recirculator setting in water.

23) VERY IMPORTANT:
Open lid on recirculator & see black or yellow looking tube on right. This is an electronic eye to keep coating at a pre-set level in tub. Bottom must not be scratched and must be very clean to work. Wash only with water and dry bottom after every use.
NOTE: Do not let eye sit in water-----about 1" below is fine.

09315796 062501

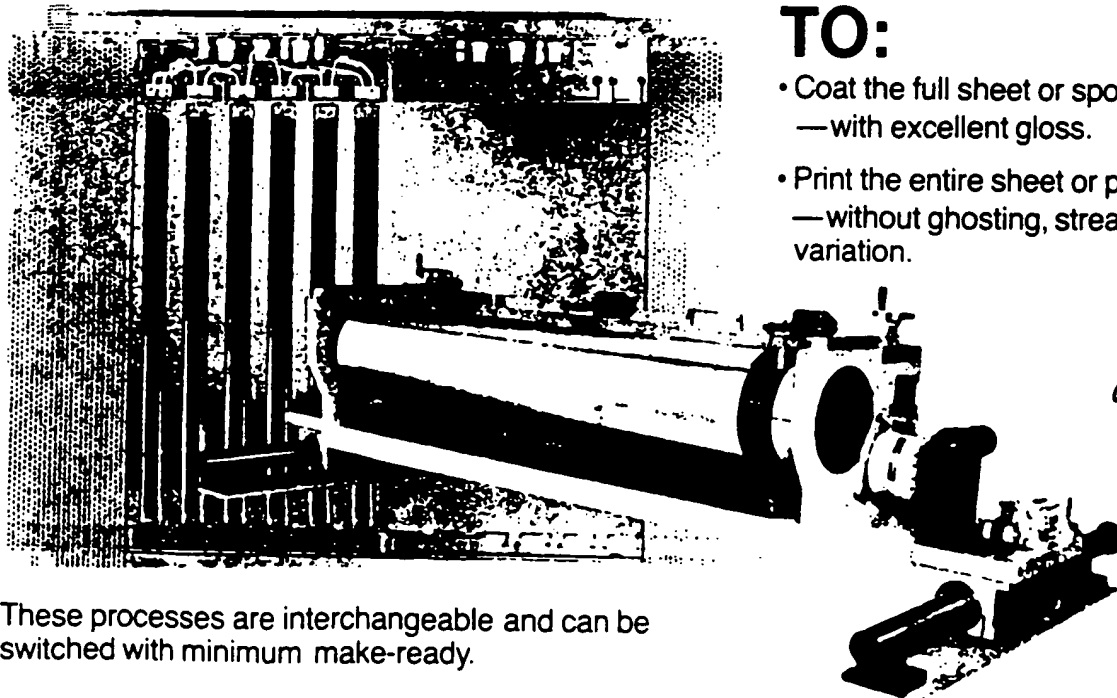
135 Line
11X17

DAHLGREN

COATER
CP
PRINTER

Two Processes In One!

The Dahlgren Coater/Printer is used in conjunction with the last printing station on a sheet-fed press.



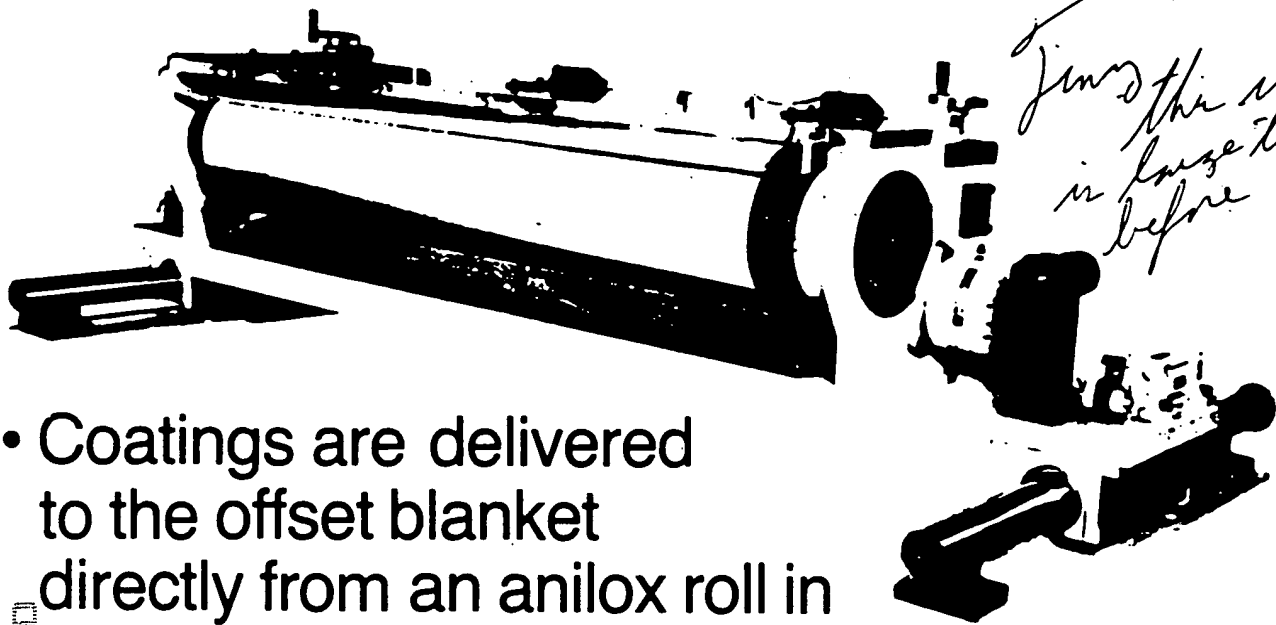
TO:

- Coat the full sheet or spot coat images
—with excellent gloss.
- Print the entire sheet or print images
—without ghosting, streaking or color variation.

These processes are interchangeable and can be switched with minimum make-ready.

W018890

The Coating Process:



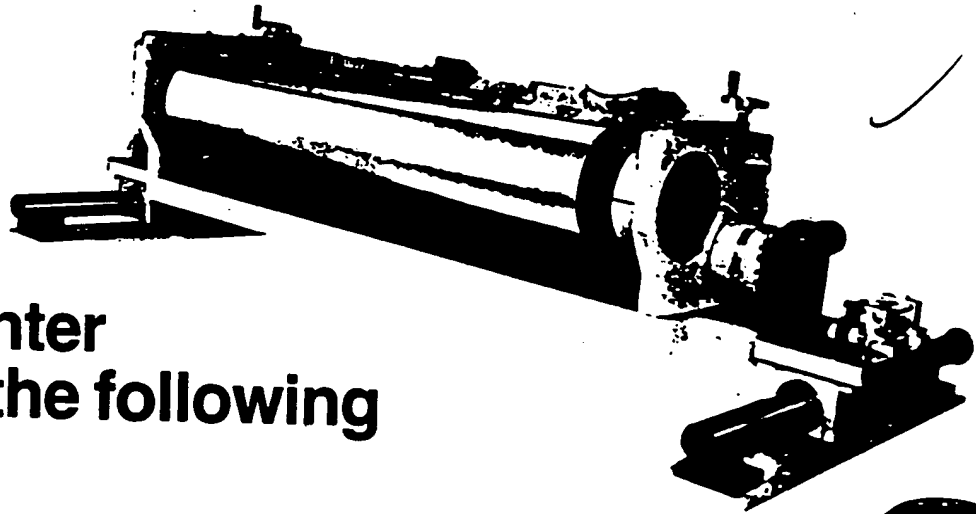
- Coatings are delivered to the offset blanket directly from an anilox roll in precisely controlled amounts and then transferred to the substrate with a high level of uniformity and consistency. It applies protective, high gloss and blister seal coatings over wet or dry surfaces with optimum efficiency.

- Various types of coatings can be used interchangeably with the Coater including aqueous and U.V. curables. Substrates of varying nature such as paperboard and plastics may also be used. Various combinations can be tested in Dahlgren's application lab to determine feasibility.

The Printing Process:

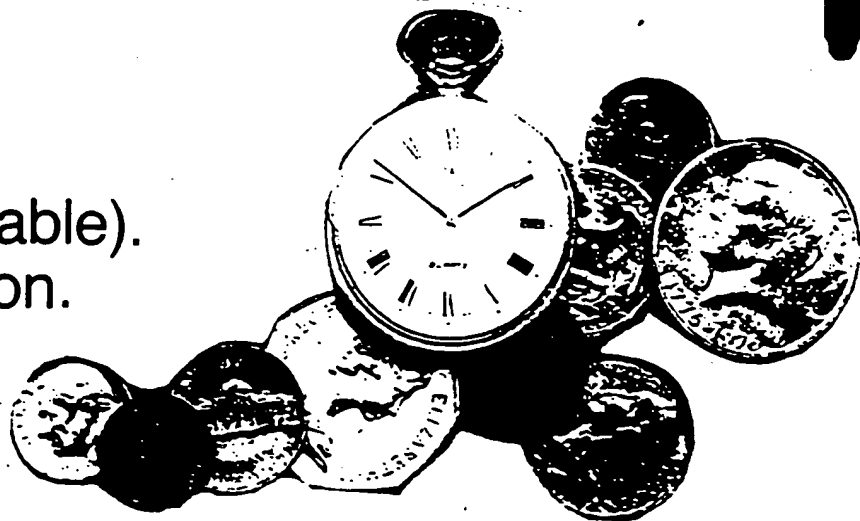
We are coating with color
—with fantastic results!

We're printing from a raised image resilient photopolymer plate. A doctor blade meters a continuous supply of ink to the anilox roll and plate with every revolution—*Totally* eliminating ghosting.



The
Coater/Printer
gives you the following
benefits:

- Ghost-free printing.
- Smoother ink lay.
- Consistent and constant color.
- Immediate response produces instant color.
- Same color front-to-back and side-to-side.
- Drier printing.
- Runs *true* fluorescent and metallic inks.
- No hickeys.
- No ink keys.
- No color waste
(3rd sheet saleable).
- No emulsification.





TO 550-9647

Dahlgren, the leader in technology and performance.

For the past three years Dahlgren has been expanding its products and services to service the changing needs of the commercial printer. The Coater/Printer evidences this commitment.

For all of the details on this remarkable new piece of equipment, contact your Dahlgren representative.



DAHLGREN

TECHNOLOGY/PERFORMANCE

Dahlgren International 3305 Manor Way
Dallas, Texas 75235 214/357-4621

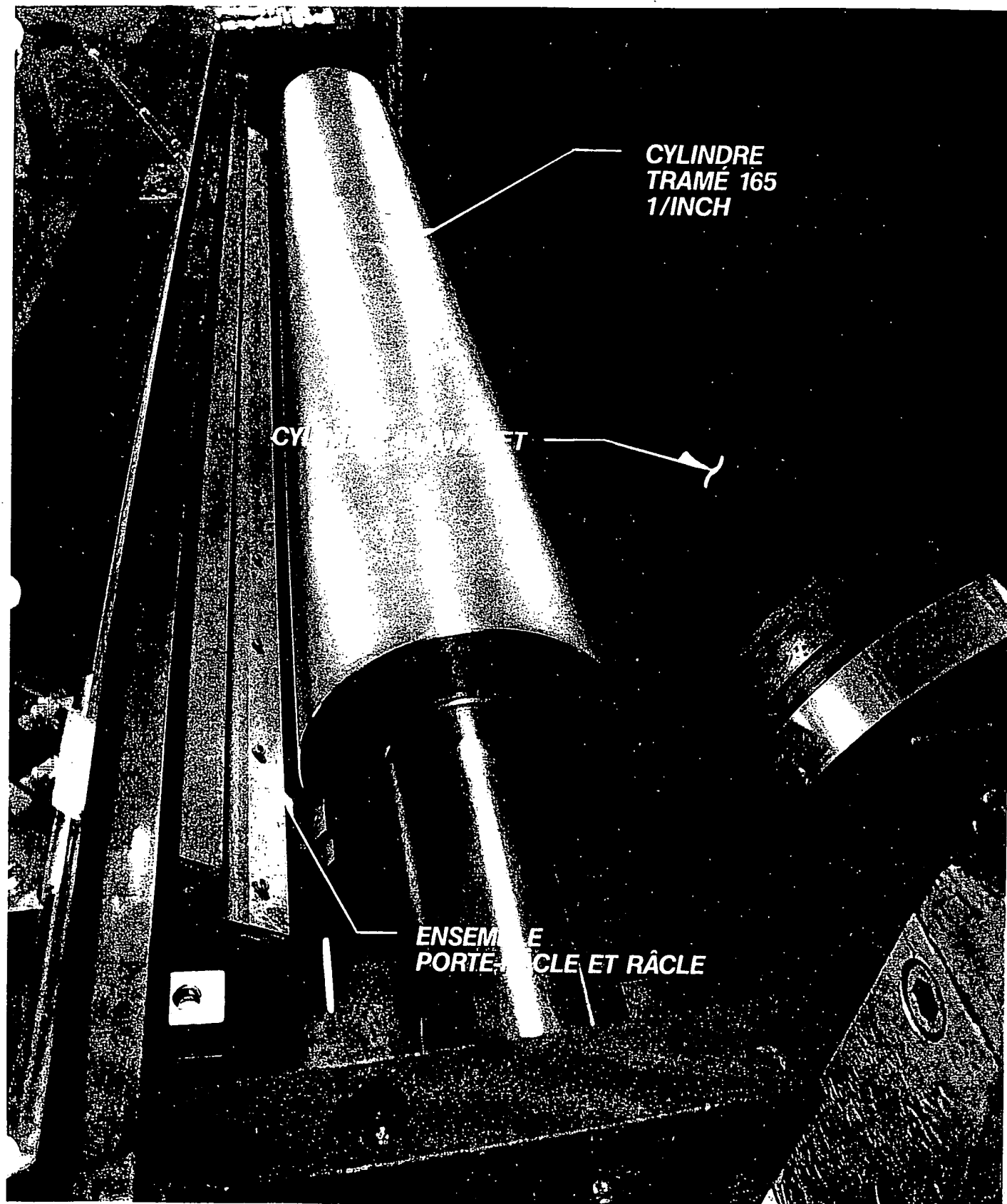
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DAHLGREN®

T05250 9675150

GROUPE DE VERNISSAGE BLANCHET

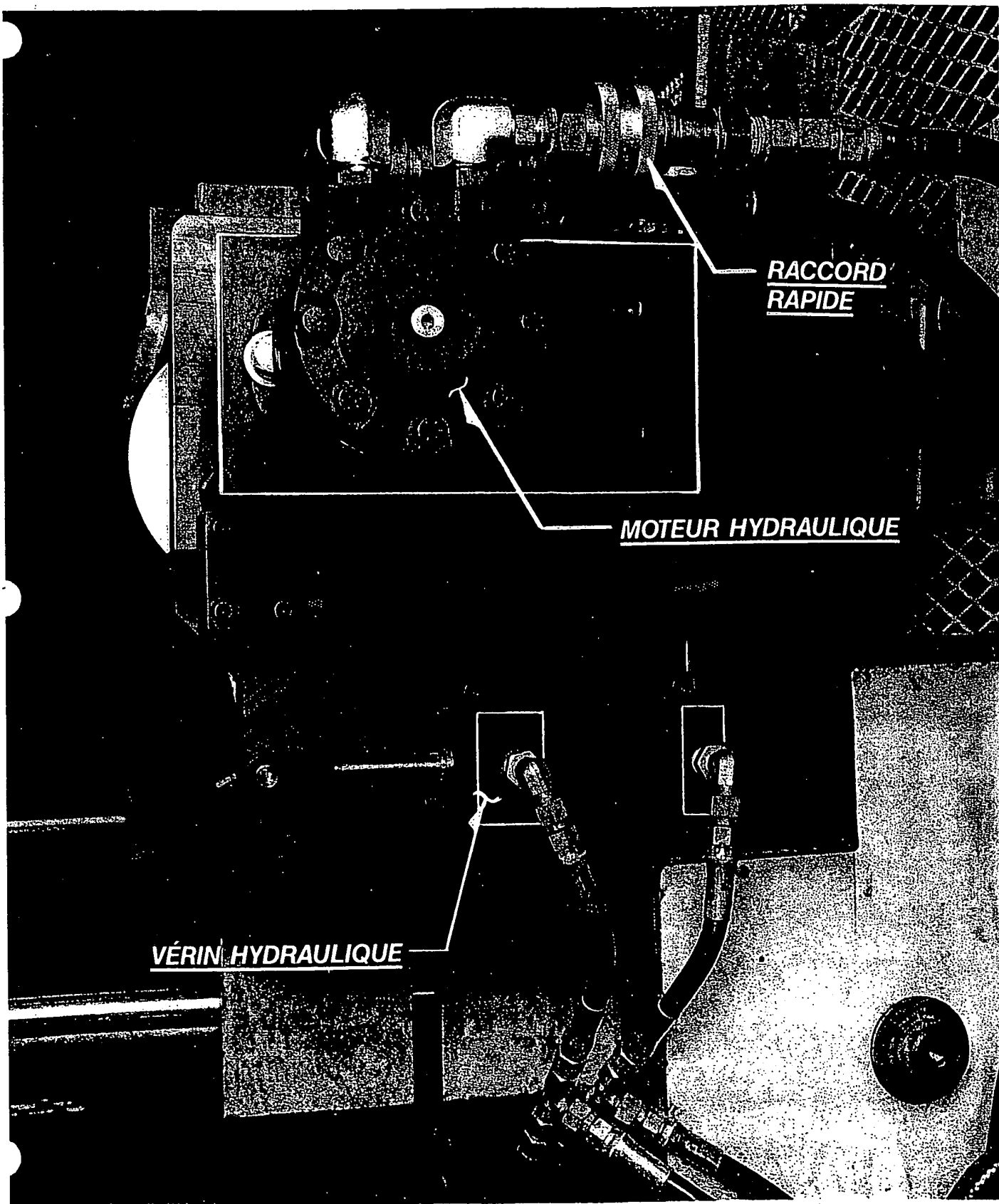
Presentation visuelle

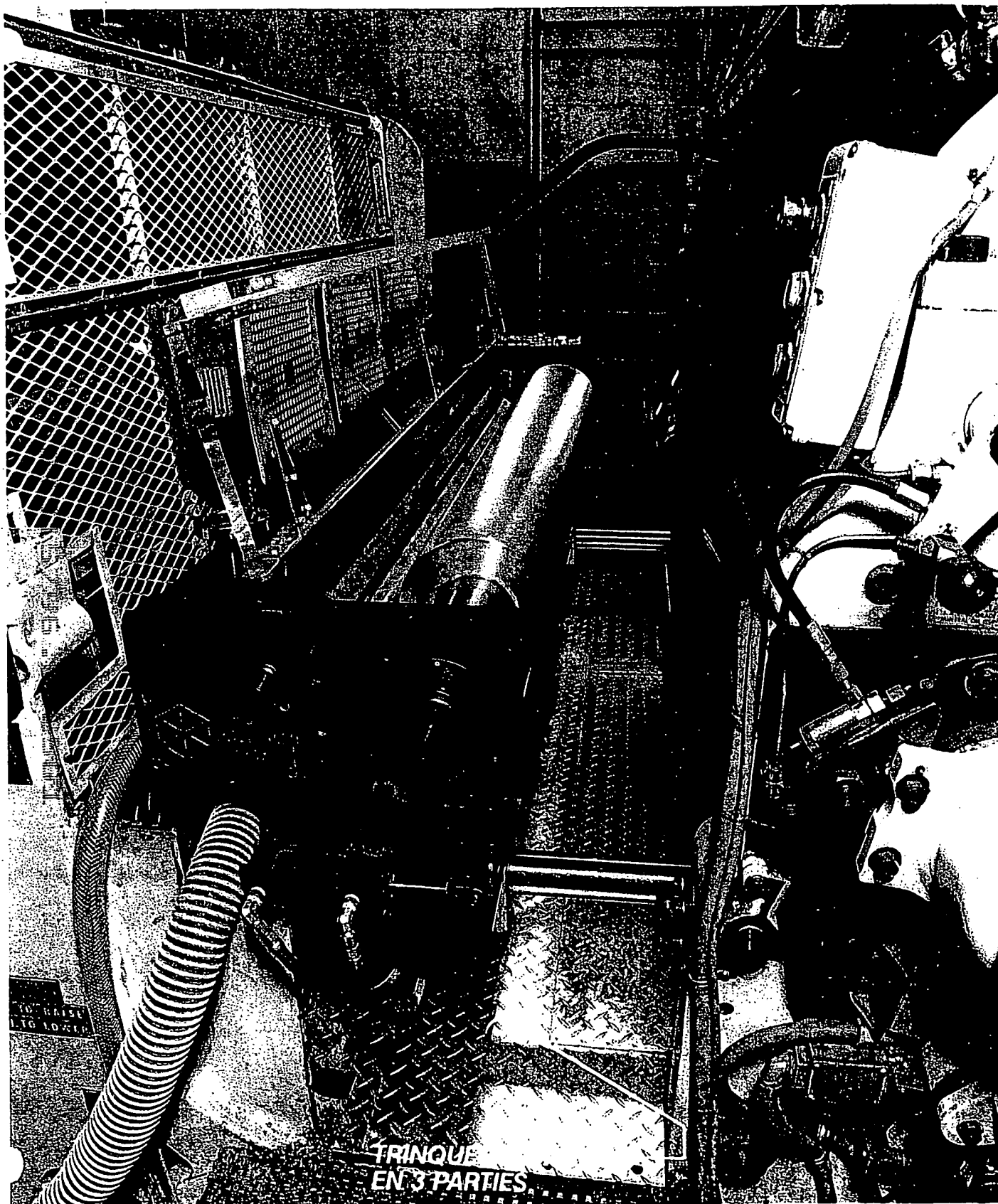


CYLINDRE
TRAMÉ 165
1/INCH

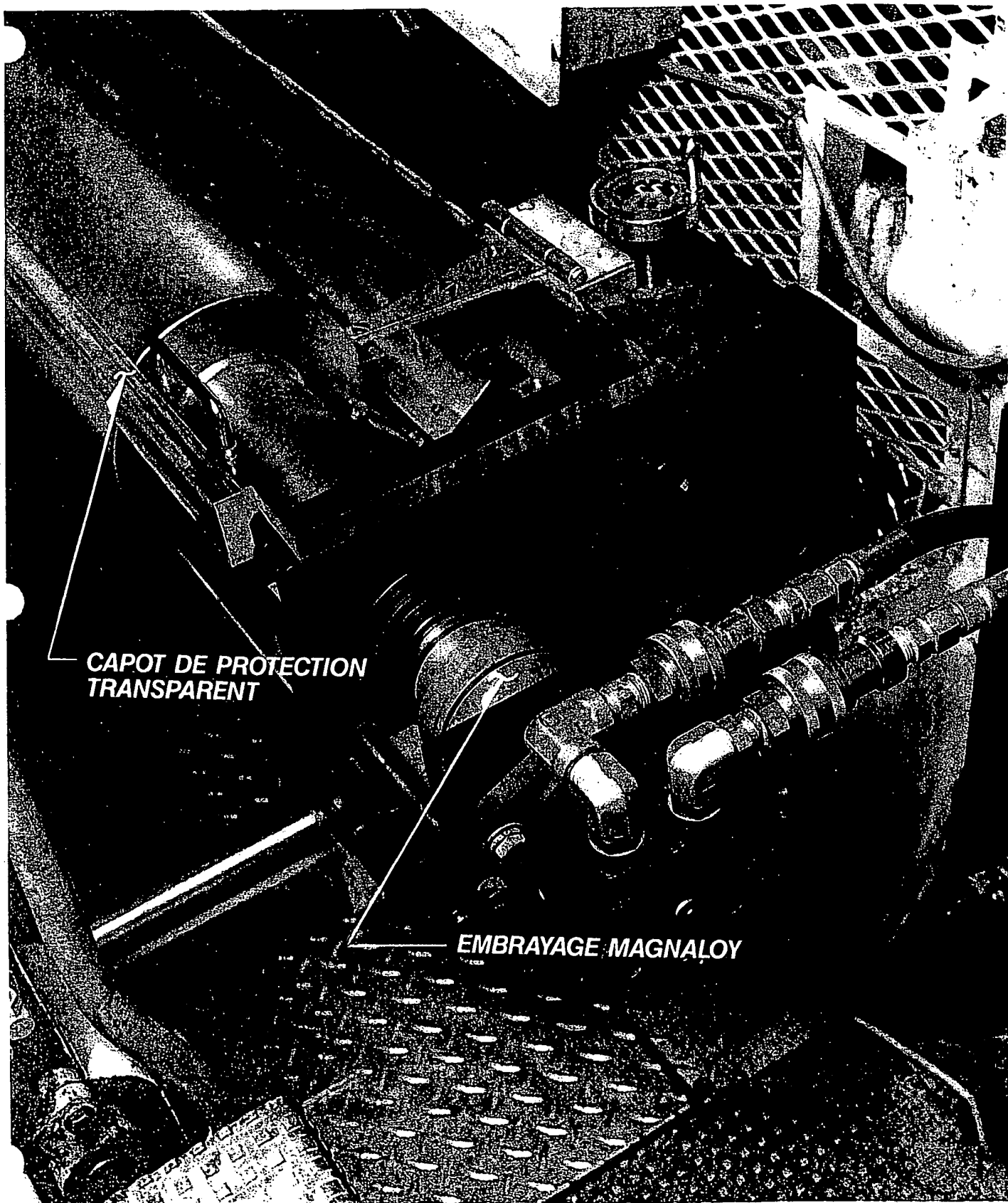
CYLINDRE 1/2 INCH Ø ET

ENSEMBLE
PORTE-TOURNEAU ET RÂCLE





W018898



**CAPOT DE PROTECTION
TRANSPARENT**

EMBRAYAGE MAGNALOY

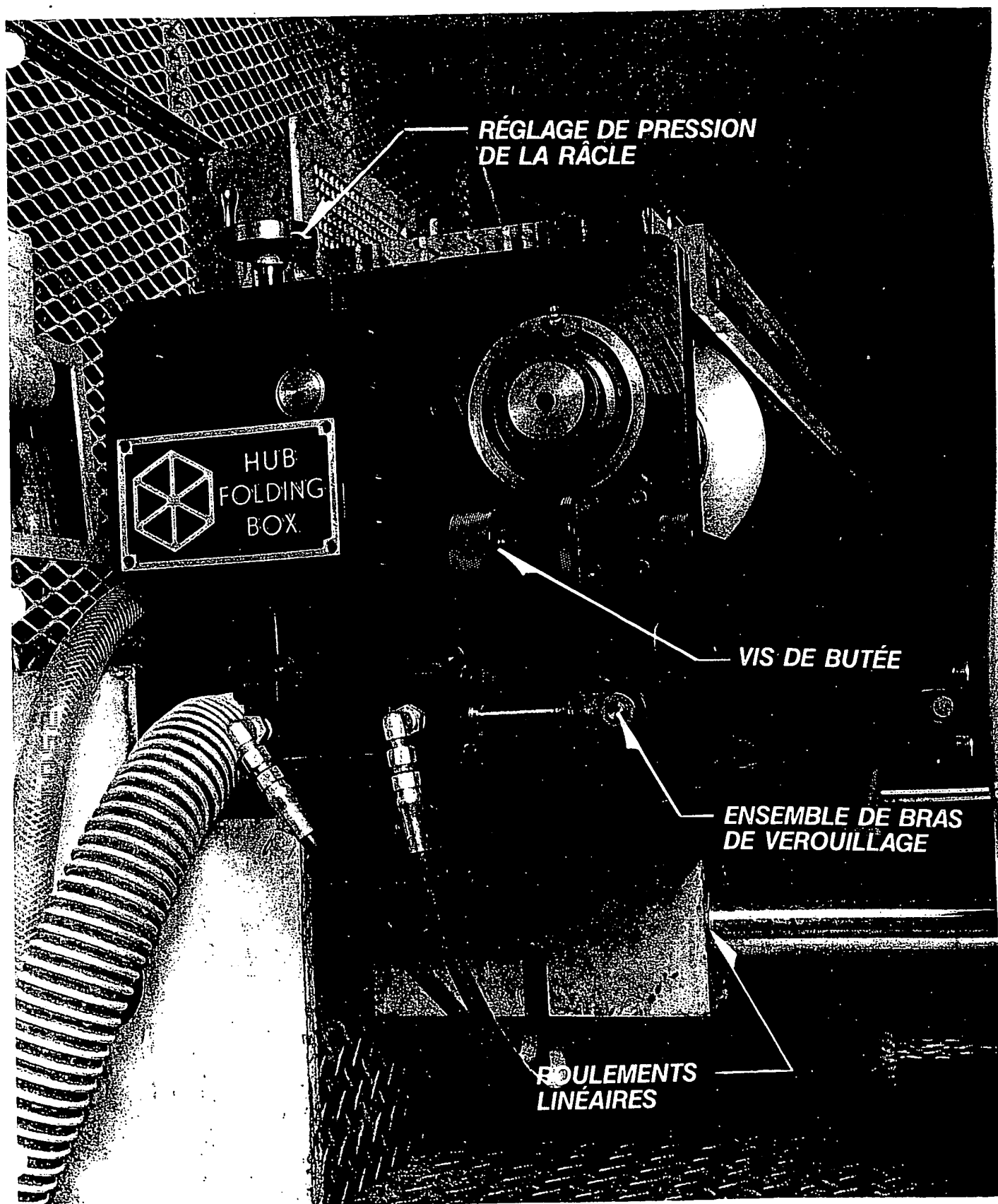
W018899



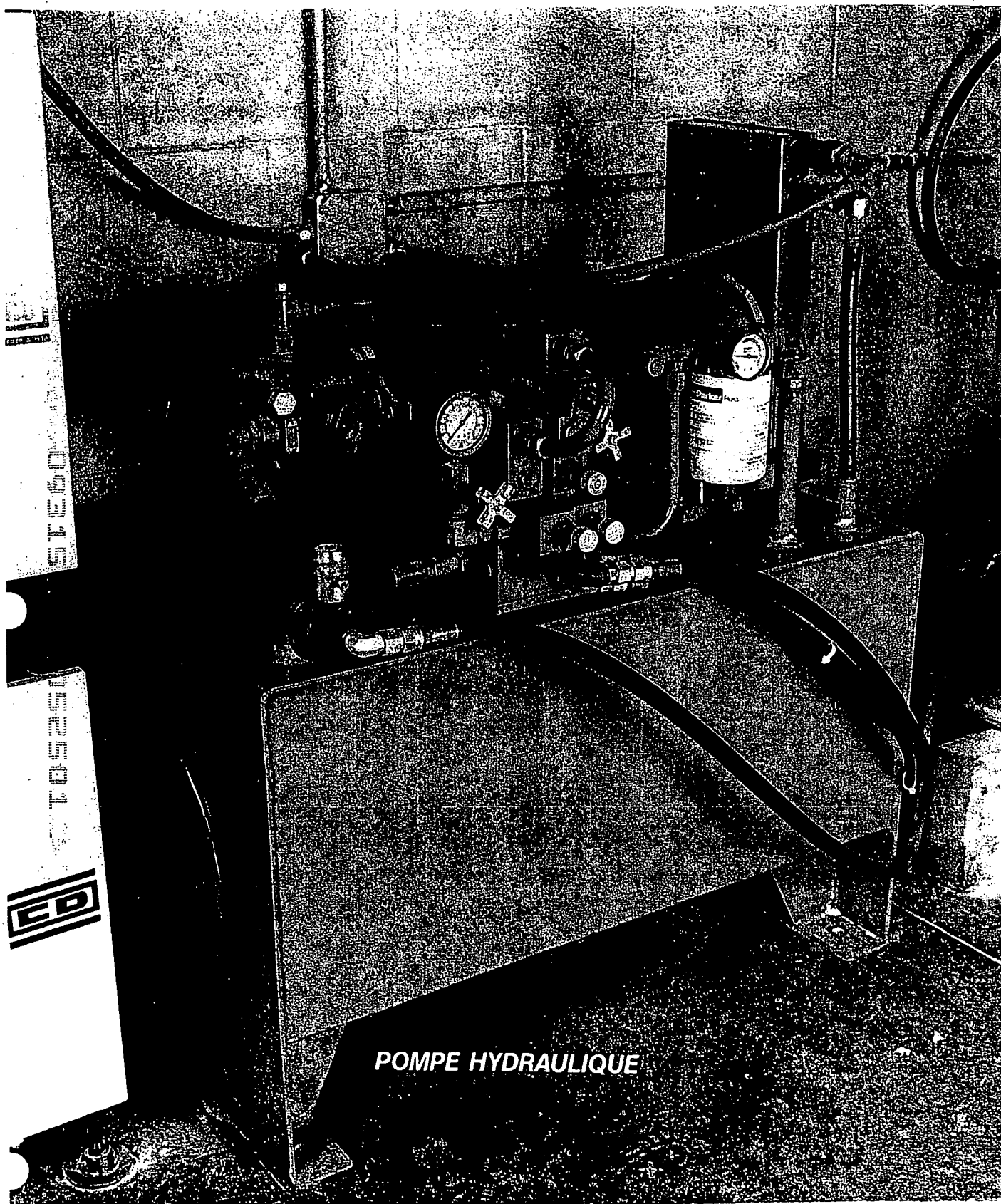
TUYAUTERIE D'AMENÉE DE VERNIS (DIAM 2,5 CM)
A LA RACLE A PARTIR D'UNE POMPE A GRAND
DEBIT MONTÉE DIRECTEMENT SUR LE FÛT
DE VERNIS

BASSINE DE RÉCUPÉRATION

TUYAUTERIE DE RETOUR
DE VERNIS (DIAM 61/64 CM)



W018901



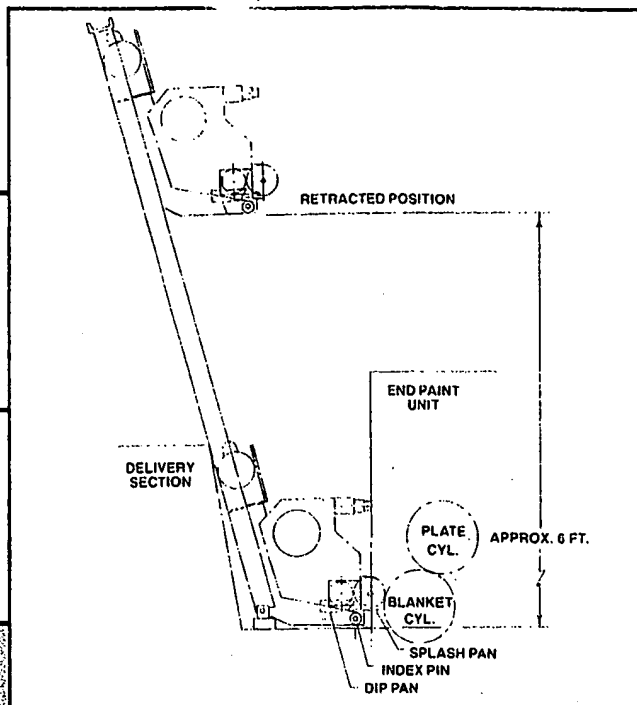
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52501



POMPE HYDRAULIQUE

Blanket Coater



Applications

This unit is capable of producing high quality results with a wide variety of coating materials including aqueous, U.V. etc.

These coatings provide a wide variety of benefits to your product. For example, high gloss, grease and water resistance, improved rub characteristics. Typically coated products are covers, brochures, packaging labels and bags.

Operation

The coating unit is positively positioned by interlocking/alignment pins assuring the proper relationship between the press blanket cylinder and the coating unit. The design of this coater provides a quick release mechanism between the rubber & ceramic rolls. This mechanism utilizes positive stops to allow disengagement without the necessity of readjustment when put back in operation. Disengagement is necessary to prevent flat spots on the rubber roll when the coater and/or press are shut down.

The ceramic and rubber rolls on the Oxy-Dry Coater are independently driven by controlled torque D.C. motors. This drive system provides inherent overload protection to prevent damage to the rolls along with convenient speed control (coating weight control). Once the coater to blankets speed relationship is selected, that ratio remains constant as press speed is changed, providing consistent coating throughout the presses speed range.

The coater retraction mechanism is actuated by a heavy duty self locking acme screw which eliminates the need for a locking device which would be necessary for ball screw device. This feature provides the greatest degree of safety and reliability.

The coating handling system offers several unique features to enhance the convenience of operation of this unit. Some of them are as follows:

A The coater uses a "two-pan" arrangement. This consists of a dip pan where circulated coating is delivered to the rubber roll. There is a second "dryer" splash pan positioned to catch spray and any foreign matter which could contaminate the coating solution. Both of these pans are removable by hand without the use of tools for clean up purposes.

B The coating material handling system consists of two pumps. The first is utilized to recirculate the coating solution and the second is a drain pump to ensure overflow free circulation. The drain pump can be operated independently to assist in clean-up operations.

C Construction: the design of this unit is consistent with Oxy-Dry's long service life philosophy. Construction is heavy duty with ease of serviceability.

The ceramic coating roll is "pillow block" mounted and the rubber transfer roll is mounted in a slide mechanism. Change over can be accomplished on the press without disassembly of the coater frame and drive mechanism.

Controls

The Oxy-Dry Blanket Coater is interfaced into the press via a programmable controller. This allows adaptability to many different press control systems and ease of changing coater operating sequences.

All electrical components are commercially available high-quality items. This provides maximum dependability and economical servicing.



OXY-DRY CORPORATION

2011 Landmeier Road
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(312) 593-2030
TWX 910-222-3458
FAX 312-593-0172

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Roselle, IN 47203
(201) 241-5440 (212) 732-2958
TWX 710-998-5979
FAX 201-241-0280

17972 Sky Park Circle
Suite H
Irvine, CA 92714
(714) 261-1441

Oxy-Dry (UK) Limited
Unit 2, Whitworth Road
Pin Green, Stevenage
Herts SG1 4QS, England
Stevenage (0483) 728881
Telex 826939

Oxy-Dry Maschinen G.M.B.H.
Bosch-Ring 19
D-6073 Egelsbach
West Germany
(061) 103 4168
Telex 417920

W018904



OXY-DRY CORPORATION

2011 Landmeier Road, Elk Grove Village, Illinois 60007

Area Code 312/593-2030
312/282-8000

Telex: 910-222-3458

November 20, 1987

R. Bill Davis

Williamson Printing Co.
6700 Denton Drive
Dallas TX 75235

ATTENTION: PRESIDENT

Dear Sir:

Having recently been elected to the Presidency of Oxy-Dry Corporation, succeeding our retiring former President, Jack Pettersen, I've decided to contact a number of our current customers with a special program as a get acquainted offer. Details are given below:

In addition to the attached special offers, I have enclosed a brochure introducing a new product that Oxy-Dry Corporation has been developing for some time now. In our opinion, this is not only extremely well engineered and ruggedly built, but it's a product that eventually every printer must have. It offers speed consistency and efficiency. It's the new Oxy-Dry High Speed Blanket Coater.

I would like to encourage you to read the attached brochure and specifications. I believe it tells the story of WHY. As a matter of fact, if you have any thoughts on this or any of our other fine products, I would appreciate hearing from you. Oxy-Dry has been in business for over 45 years and specifically two words that uniquely describe our internal dedication are: Quality and Integrity.

SPECIAL OFFER: Our Sales Department generated the attached green sheets concept as a thank you gesture for the many years of your support and business. As mentioned above, we'd all very much appreciate your feedback on not only the attached supply items but on any item of related interest.

Thank you again for your continued support over the years.

Sincerely,

OXY-DRY CORPORATION

E. T. McLoughlin
Edward T. McLoughlin
President

ETM/rmo

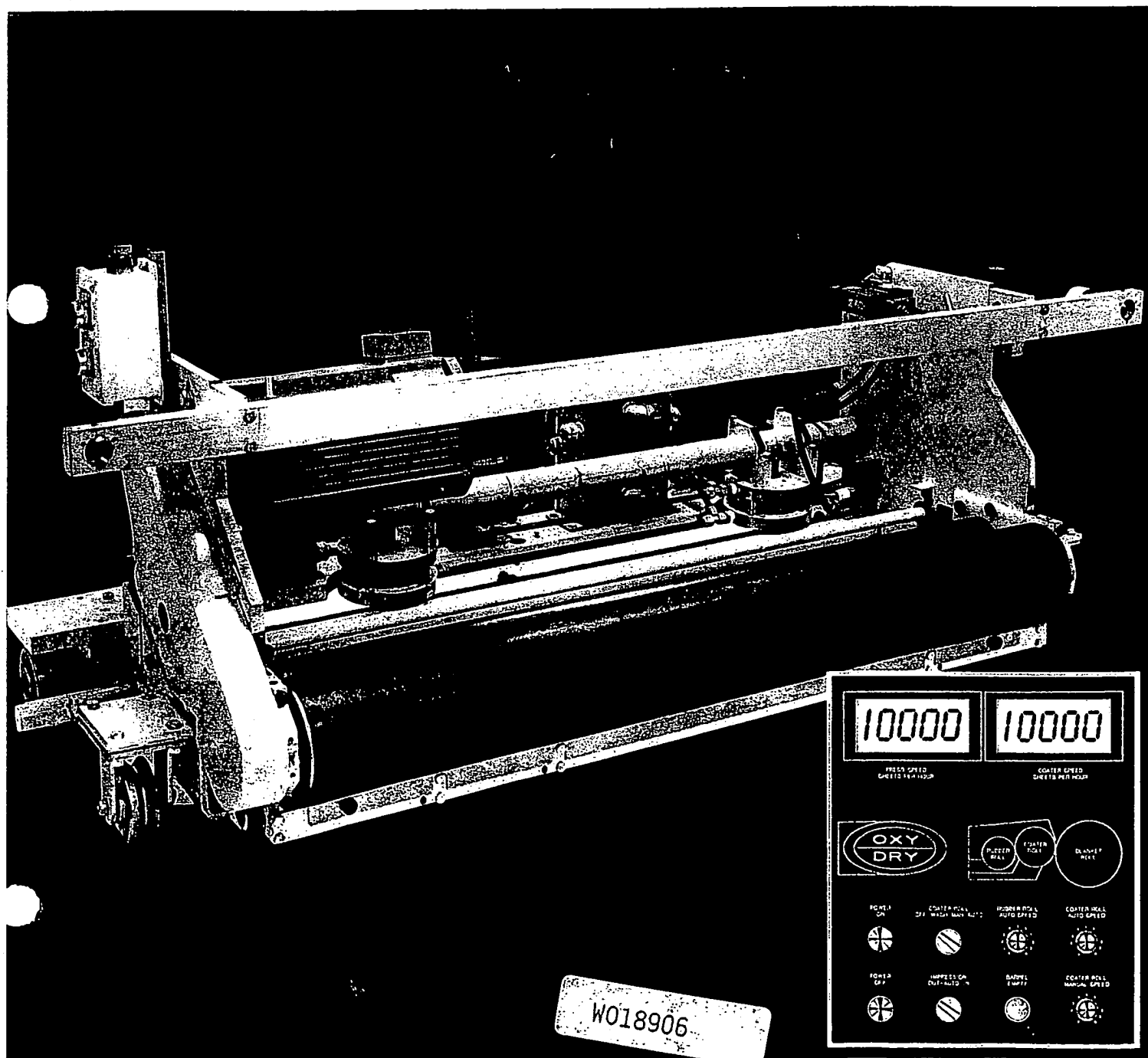
Enclosures

W018905

The very best way to apply coating is with an

OXY-DRY COATER

Now your printing can be worth more, much more



Coating makes a big difference

and here's why:

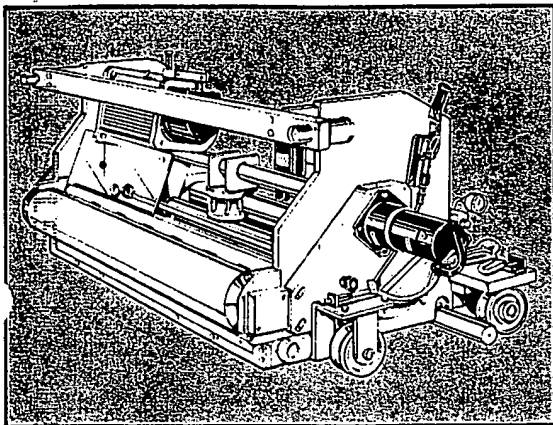
This Oxy-Dry Coater specification sheet has been printed with coating. Feel it and then objectively contemplate the comparisons. . . it gives an everlasting focus of quality to the printed piece. It makes your printing worth more . . . much more, because it's magnificently different and will give you a leg up on the competition. The new Oxy-Dry Coater has been engineered to readily fit most presses. It is ruggedly constructed and simple to install and operate. The Oxy-Dry Coater saves time and assures a smooth uniform application of aqueous coating. In addition, it reduces the use of offset powders. Quality coating generates high gloss, improved rub resistance, regulated surface slip and controlled variations in luster.

Oxy-Dry invented and pioneered the Electrostatic Sprayer to prevent offset and developed the powder formulas to go along with the electrostatic sprayers as well. Oxy-Dry in almost 50 years of serving the printing industry with revolutionary new products such as the Blanket Washers, Ink Agitators, Ink Levelers, Sheetters, Stackers, Color-to-Color Systems, Cut-off Controls, Web Breaks and Web Guides, has also brought to market a Dryer that provides the right drying acceleration. Oxy-Dry is proud to engineer another much needed and valued accessory to the printing press. The Oxy-Dry Coater now adds a truly new dimension to printing.

COMPARISON OF COATINGS

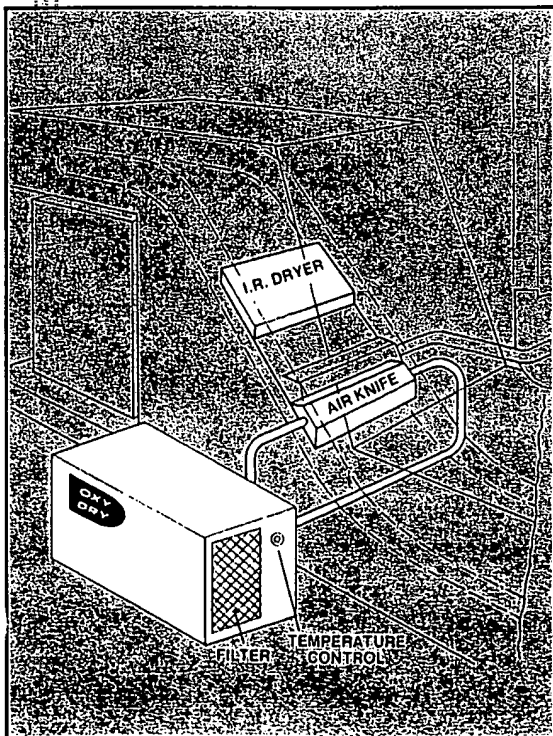
COATING	AQUEOUS	U.V.	PRESS VARNISH
Gloss	Good/Excellent	Excellent	Fair
Rub	Good/Excellent	Excellent	Fair
Glue Applications	Excellent	Fair	Poor
Thickness Control	Excellent	Good	Fair
Finger Prints	Excellent	Poor	Fair
EPA Safety Reference	Excellent	Poor	Good
Coating Costs	Economical	Expensive	Economical

The Oxy-Dry System



Oxy-Dry Coater Facts

- 1 Control of Coating:** The Oxy-Dry Coater allows a wide range of coating thickness and infinite control with just a turn of a dial on the control panel.
- 2 Simplicity of Operation:** The Oxy-Dry Coater is designed to return to a pre-set position each time the coater is used, no costly makeready adjustment.
- 3 Ease of Maintenance:** The Oxy-Dry Coating System provides easy access to rollers and recirculating system. Makeready and Washup will take approximately 15 minutes.
- 4 Spot Coating:** The Oxy-Dry Coater's unique micrometer adjustment allows spot coating by simply cutting packing under the blanket.



Oxy-Dry Medium Wave Infrared Dryer

The main advantages of the Oxy-Dry Infrared Dryer are:

- Variable/Medium wave length radiation with high intensity output
- Quick response
- Significant energy savings
- Simplicity of operation

To achieve an optimum of infrared radiation high intensity output it is necessary to heat the substrate within the minimum distance of sheet travel. A quick response is also essential—in that an instantaneous heat up and cool down is required when the press comes on or off impression. The Oxy-Dry "tubeless" dryer is most unique in these two features—high intensity output coupled with quick response.

Oxy-Dry Air Knife

The Oxy-Dry Heated Air Knife was designed specifically to compliment the Oxy-Dry Blanket Coater. It will provide two "curtains" of air across the sheet (or web) at velocity up to 4600 ft. per minute. The air is heated by a high efficiency electric heater which can provide temperatures from ambient to 200°F.

OXY-DRY Blanket Coater

Applications

This unit is capable of producing high quality results with a wide variety of coating materials including aqueous, U.V., etc.

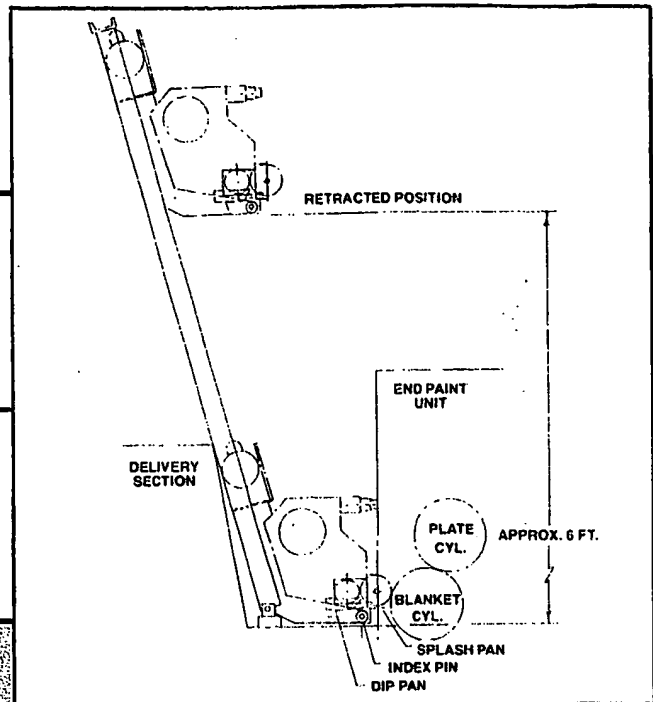
These coatings provide a wide variety of benefits to your product. For example, high gloss, grease and water resistance, improved rub characteristics. Typically coated products are covers, brochures, packaging labels and bags.

Operation

The coating unit is positively positioned by interlocking alignment pins assuring the proper relationship between the press blanket cylinder and the coating unit. The design of this coater provides a quick release mechanism between the rubber & ceramic rolls. This mechanism utilizes positive stops to allow disengagement without the necessity of readjustment when put back in operation. Disengagement is necessary to prevent "flat spots" on the rubber roll when the coater and/or press are shut down.

The ceramic and rubber rolls on the Oxy-Dry Coater are independently driven by controlled torque D.C. motors. This drive system provides inherent overload protection to prevent damage to the rolls along with convenient speed control (coating weight control). Once the coater to blanket speed relationship is selected, that ratio remains constant as press speed is changed providing consistent coating throughout the presses speed range.

The coater retraction mechanism is actuated by a heavy duty self locking acme screw which eliminates the need for a locking device which would be necessary for ball screw device. This feature provides the greatest degree of safety and reliability.



The coating handling system offers several unique features to enhance the convenience of operation of this unit. Some of them are as follows:

- A** The coater uses a "two pan" arrangement. This consists of a dip pan where circulated coating is delivered to the rubber roll. There is a second "dryer" splash pan positioned to catch spray and any foreign matter which could contaminate the coating solution. Both of these pans are removable by hand without the use of tools for clean up purposes.
- B** The coating material handling system consists of two pumps. The first is utilized to recirculate the coating solution and the second is a drain pump to ensure overflow free circulation. The drain pump can be operated independently to assist in clean up operations.
- C** Construction: the design of this unit is consistent with Oxy-Dry's long service life philosophy. Construction is heavy duty with ease of serviceability. The ceramic coating roll is "pillow block" mounted and the rubber transfer roll is mounted in a slide mechanism. Change over can be accomplished on the press without disassembly of the coater frame and drive mechanism.

Controls

The Oxy-Dry Blanket Coater is interfaced into the press via a programmable controller. This allows adaptability to many different press control systems and ease of changing coater operating sequences. All electrical components are commercially available high quality items. This provides maximum dependability and economical servicing.



OXY-DRY CORPORATION

2011 Landmeyer Road
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217 Highland Parkway
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(201) 241-5440 (212) 732-2958
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FAX 201-241-0280

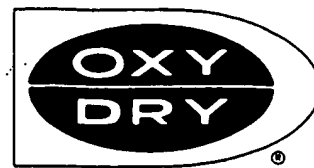
17972 Sky Park Circle
Suite H
Irvine, CA 92714
(714) 261-1441

Oxy-Dry (UK) Limited
Unit 2, Whitworth Road
Pin Green, Stevenage
Herts SG1 4QS, England
Stevenage (0483) 728881
Telex: 826939

Oxy-Dry Maschinen G.M.B.H.
Bosch Ring 19
D-6073 Egelsbach
West Germany
(06) 103 4166
Telex: 417920

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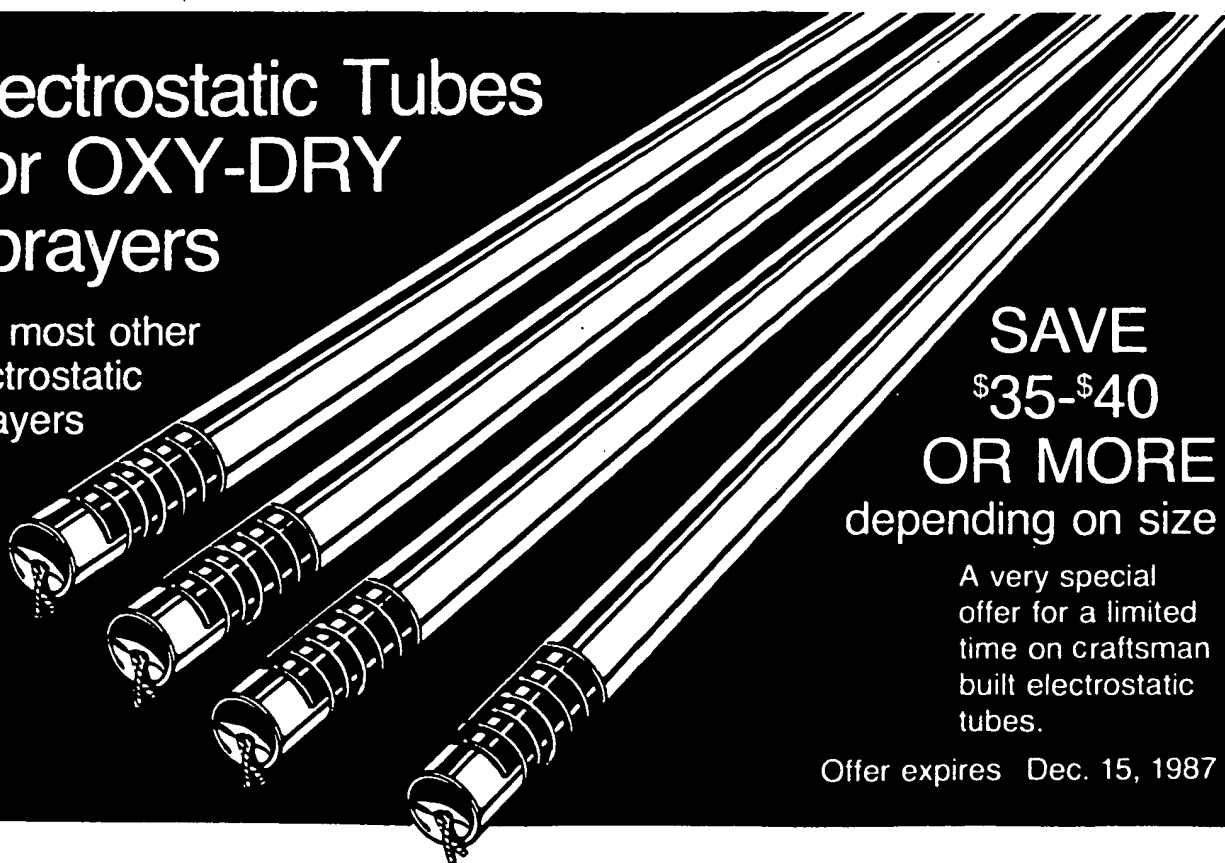
Best Buy Ever!



BUY 3 NOW GET THE 4TH FREE!

Electrostatic Tubes For OXY-DRY Sprayers

Fits most other
electrostatic
sprayers



SAVE
\$35-\$40
OR MORE
depending on size

A very special
offer for a limited
time on craftsman
built electrostatic
tubes.

Offer expires Dec. 15, 1987

Take advantage of this special offer by returning this coupon today.

We've never made an offer like
this before. It is an unusual offer
that saves you more... much
more.

Your order No. _____

Make of press _____

Tube size—length _____

(Please print)

Ship To: _____

Company Name _____

Address _____

City _____ State _____ Zip _____

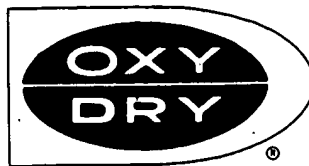
Authorized Signature _____

Date _____

Send coupon to OXY-DRY Corporation, 2011 Landmeier Road,
Elk Grove Village, IL 60007

W018909

Brand New from



*The very best way to
prevent offset is with
OXY-DRY Powders*

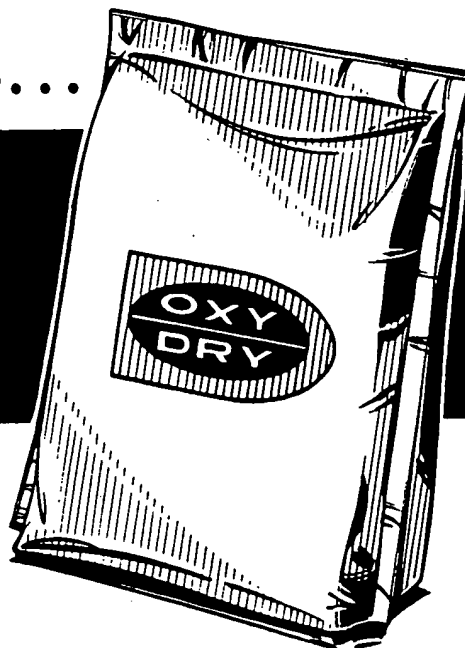
OXY-DRY POWDERS IN A NEW 2-LB. SINGLE SERVING POUCH

Test it—you'll like it...

**FREE
SAMPLE POUCH**

**We'll send you your 2-lb. pouch just for
answering these few questions.**

Our pouch approach is brand new. We believe
it will make loading a sprayer neater, easier and
cleaner. The new OXY-DRY Pouch can be
purchased with 5 to a carton.



**IDEAL SIZE
FOR EASY
HANDLING**

The Pouch Powder is
OXY-DRY Powder 744,
micron size 27.

For other OXY-DRY
powders refer to the
OXY-DRY Powders
specification sheet.

Offer expires
Dec. 15, 1987

① What powders are you presently using?

② What micron size powder do you use?

③ Press(es) you presently use?

④ Type of printing you perform?

⑤ Do you use an OXY-DRY Sprayer or other brand?

Please specify _____

(Please print)

Ship To: _____

Company Name _____

Address _____

City _____ State _____ Zip _____

Authorized Signature _____ Date _____

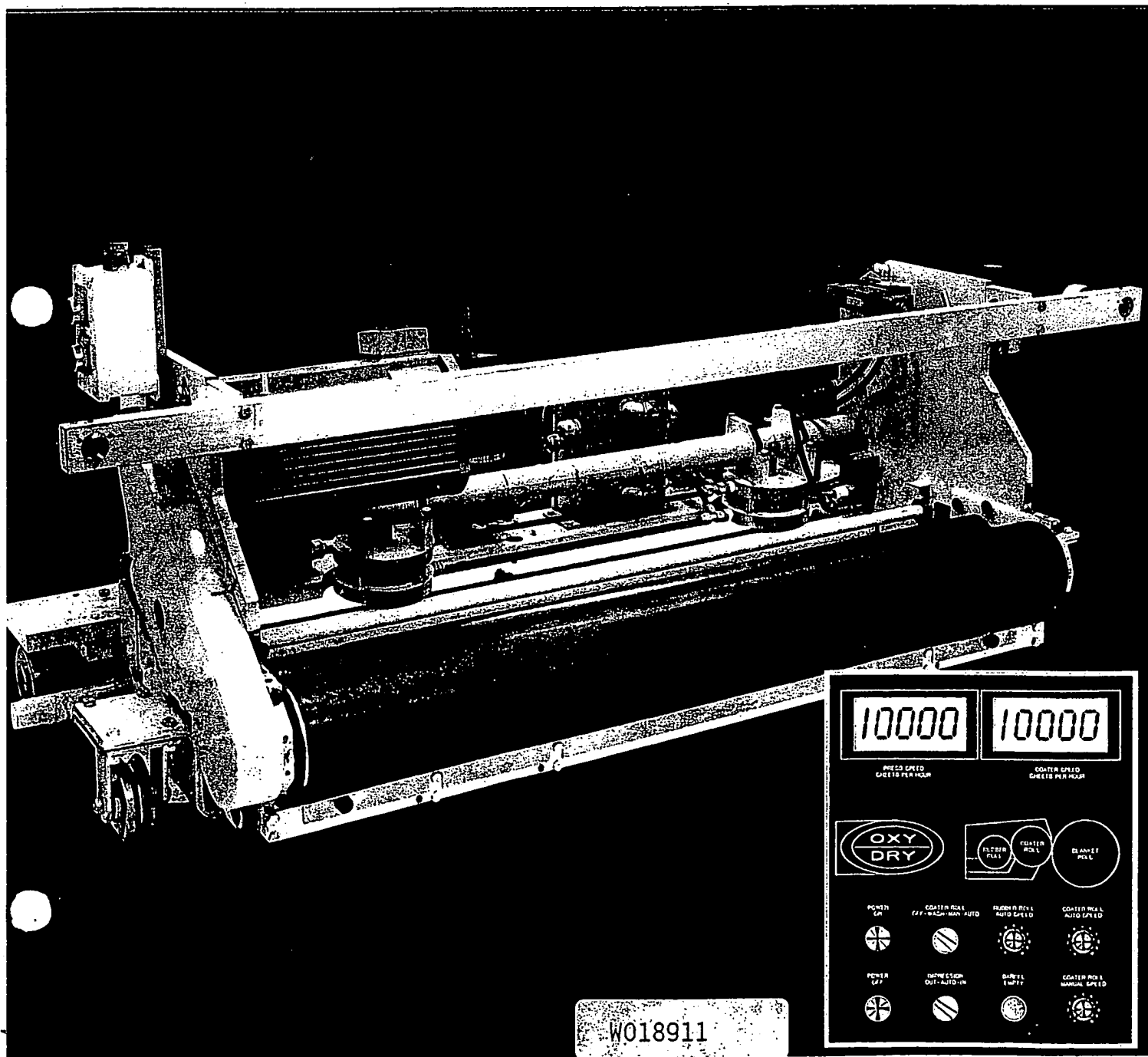
Send to: **OXY-DRY CORPORATION**
2011 Landmeier Road
Elk Grove Village, IL 60007

W018910

The very best way to apply coating is with an

OXY-DRY COATER

Now your printing can be worth more, much more



W018911

Coating makes a big difference

and here's why:

This Oxy-Dry Coater specification sheet has been printed with coating. Feel it and then objectively contemplate the comparisons . . . it gives an everlasting focus of quality to the printed piece. It makes your printing worth more . . . much more, because it's magnificently different and will give you a leg up on the competition. The new Oxy-Dry Coater has been engineered to readily fit most presses. It is ruggedly constructed and simple to install and operate. The Oxy-Dry Coater saves time and assures a smooth uniform application of aqueous coating. In addition, it reduces the use of offset powders. Quality coating generates high gloss, improved rub resistance, regulated surface slip and controlled variations in luster.

Oxy-Dry invented and pioneered the Electrostatic Sprayer to prevent offset and developed the powder formulas to go along with the electrostatic sprayers as well. Oxy-Dry in almost 50 years of serving the printing industry with revolutionary new products such as the Blanket Washers, Ink Agitators, Ink Levelers, Sheeters, Stackers, Color-to-Color Systems, Cut-off Controls, Web Breaks and Web Guides, has also brought to market a Dryer that provides the right drying acceleration. Oxy-Dry is proud to engineer another much needed and valued accessory to the printing press. The Oxy-Dry Coater now adds a truly new dimension to printing.

COMPARISON OF COATINGS

COATING	AQUEOUS	U.V.	PRESS VARNISH
Gloss	Good/Excellent	Excellent	Fair
Rub	Good/Excellent	Excellent	Fair
Glue Applications	Excellent	Fair	Poor
Thickness Control	Excellent	Good	Fair
Finger Prints	Excellent	Poor	Fair
EPA Safety Reference	Excellent	Poor	Good
Coating Costs	Economical	Expensive	Economical



OXY-DRY CORPORATION

2011 Landmeier Road, Elk Grove Village, Illinois 60007

Area Code 312/593-2030
312/282-8000

Telex: 910-222-3458

OXY-DRY HIGH SPEED BLANKET COATER

APPLICATIONS

This unit is capable of producing a high quality product with a durable finish while utilizing a wide variety of coating materials to include the aqueous, U.V., or related coating materials.

These coatings can provide a variety of benefits to your printed products. For example: high gloss, increased grease and water resistance and improved rub characteristics. Typically coated products are covers, brochures, packaging labels and bags.

OPERATION

The coating unit is positively positioned by interlocking/alignment pins assuring the proper relationship between the press blanket cylinder and the coating unit. The design of this coater provides a quick release mechanism between the rubber and ceramic rolls. This mechanism utilizes positive stops to allow disengagement without the necessity for readjustment when put back in operation. Disengagement is necessary to prevent "flat spots" on the rubber roll when the coater and/or press are shut down.

Torque controlled rolls on the Oxy-Dry Coater are independently driven by controller torque D.C. motors. This drive system provide inherent overload protection to prevent damage to the rolls along with convenient speed control. Once the coater to blanket speed relationship is selected, that ratio remains constant as press speed changes. This provides consistent coating throughout the press speed range.

As the coater retraction mechanism is actuated, heavy duty self-locking acme screws eliminate the need for a locking device which would normally be used in ball screw mechanisms. This feature provides the greatest degree of safety and reliability for the end user.

1. The coater uses a "two pan" arrangement. This consists of a dip pan where circulated coating is delivered to the rubber roll. There is a second "dry" drip pan position to catch spray and any foreign matter which could contaminate the coating solution. Both of these pans are removable by hand without the use of tools for clean-up purposes.

W018913

OXY-DRY HIGH SPEED BLANKET COATER

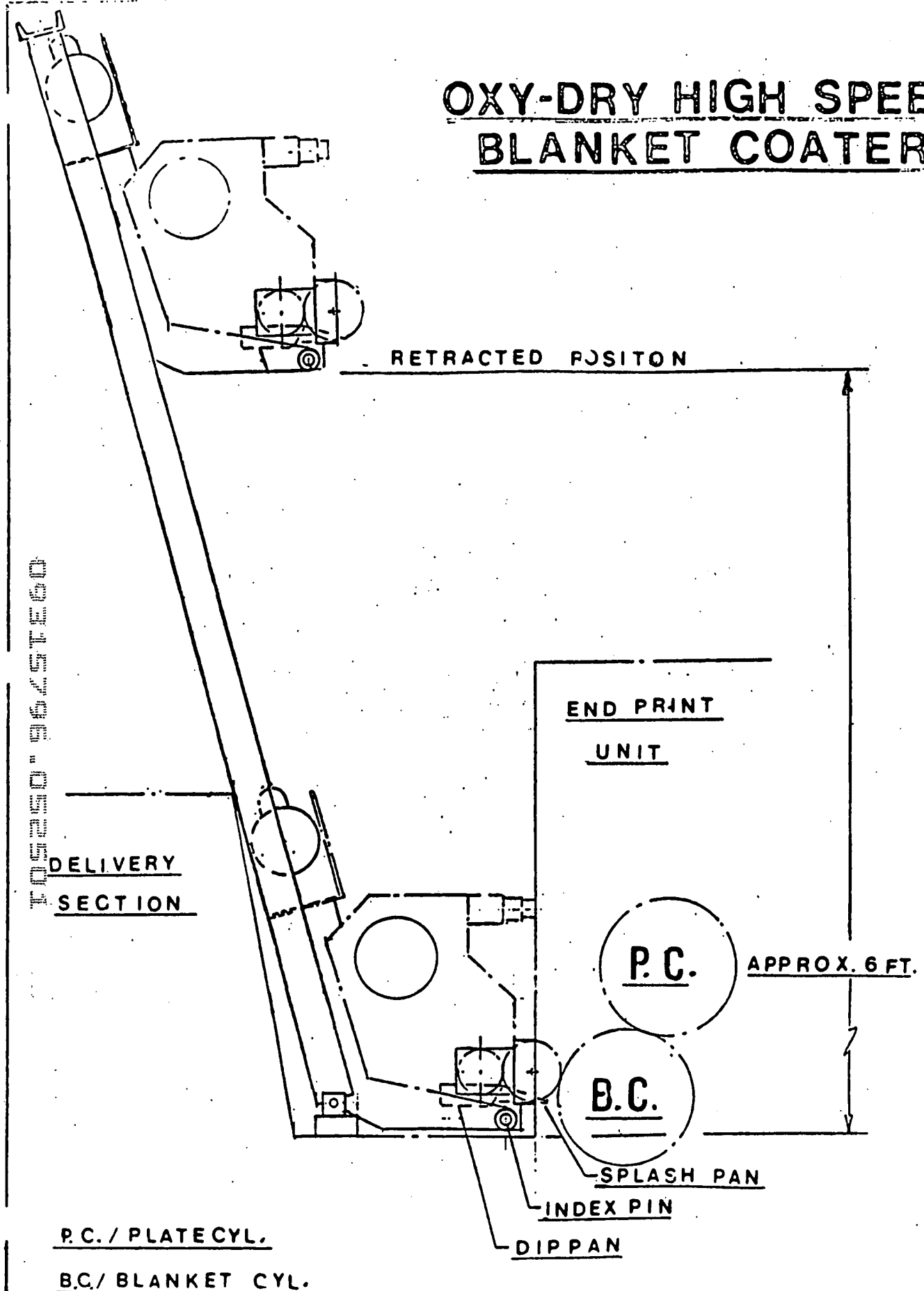
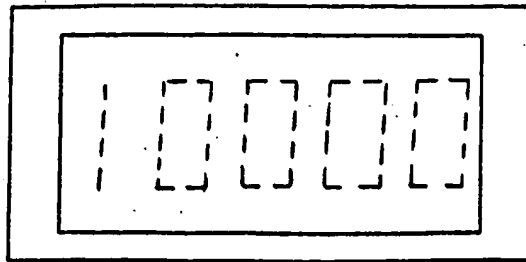
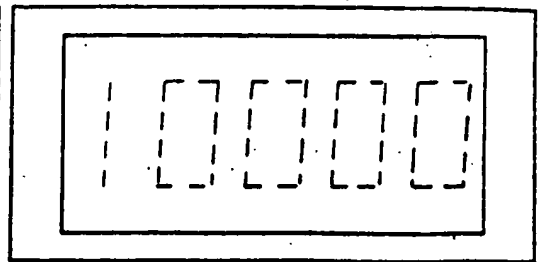


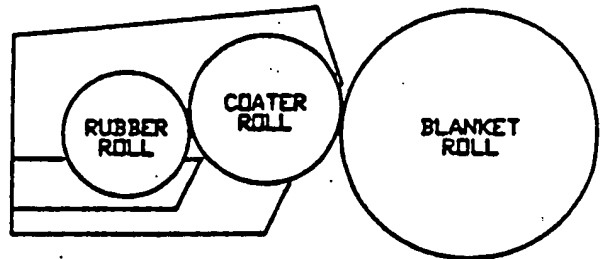
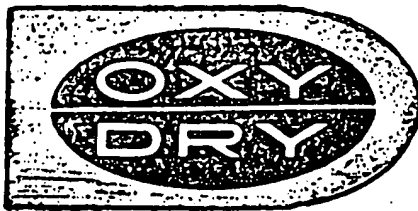
FIGURE 96-51650



PRESS SPEED
SHEETS PER HOUR



COATER SPEED
SHEETS PER HOUR



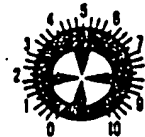
POWER
ON



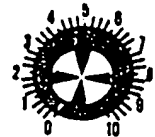
COATER ROLL
OFF-VASH-MAN-AUTO



RUBBER ROLL
AUTO SPEED



COATER ROLL
AUTO SPEED



POWER
OFF



IMPRESSION
OUT-AUTO-IN



BARREL
EMPTY

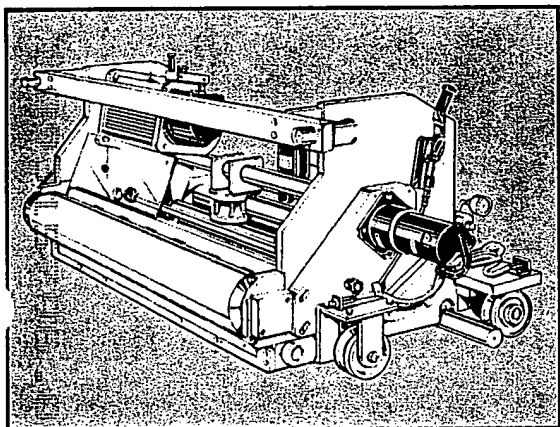


COATER ROLL
MANUAL SPEED



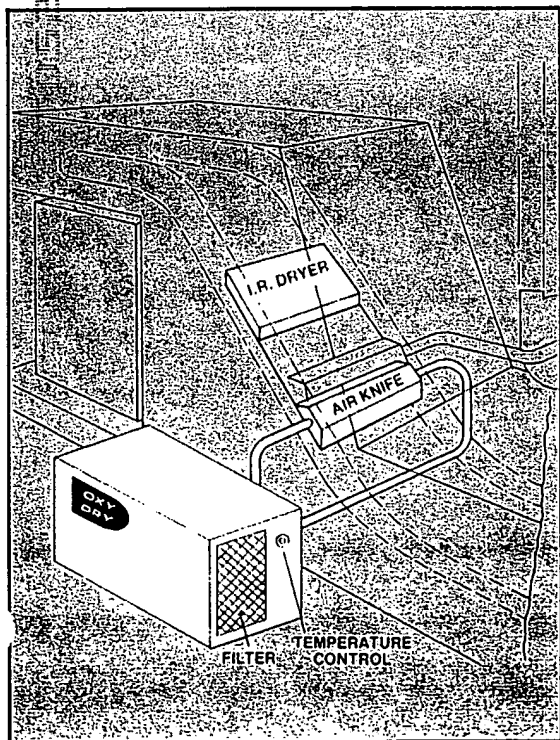
OXY-DRY HIGH SPEED
BLANKET COATER

The Oxy-Dry System



Oxy-Dry Coater Facts

- 1 **Control of Coating:** The Oxy-Dry Coater allows a wide range of coating thickness and infinite control with just a turn of a dial on the control panel.
- 2 **Simplicity of Operation:** The Oxy-Dry Coater is designed to return to a pre-set position each time the coater is used, no costly makeready adjustment.
- 3 **Ease of Maintenance:** The Oxy-Dry Coating System provides easy access to rollers and recirculating system. Makeready and Washup will take approximately 15 minutes.
- 4 **Spot Coating:** The Oxy-Dry Coater's unique micrometer adjustment allows spot coating by simply cutting packing under the blanket.



Oxy-Dry Medium Wave Infrared Dryer

The main advantages of the Oxy-Dry Infrared Dryer are:

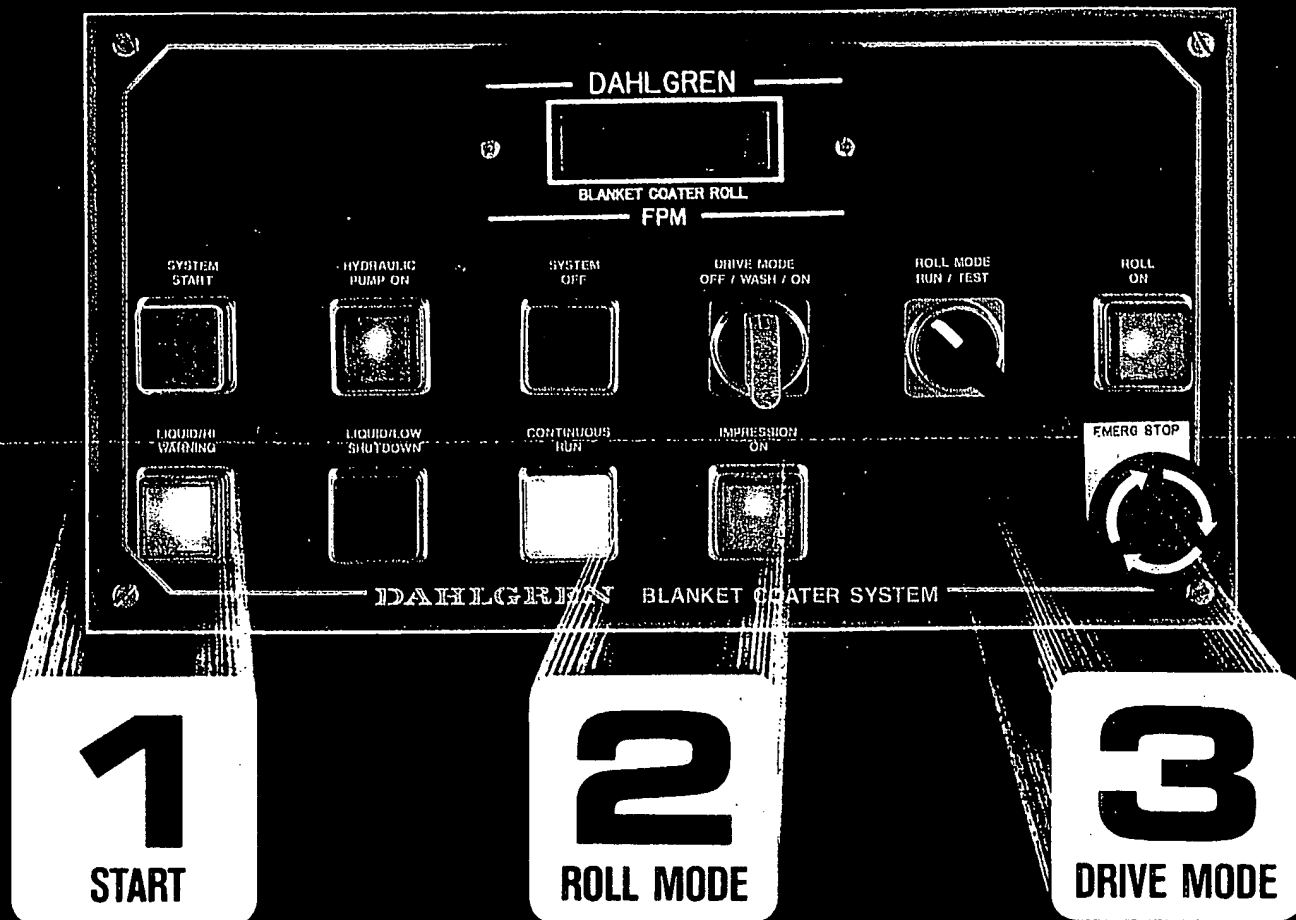
- Variable/Medium wave length radiation with high intensity output
- Quick response
- Significant energy savings
- Simplicity of operation

To achieve an optimum of infrared radiation high intensity output it is necessary to heat the substrate within the minimum distance of sheet travel. A quick response is also essential—in that an instantaneous heat up and cool down is required when the press comes on or off impression. The Oxy-Dry "tubeless" dryer is most unique in these two features—high intensity output coupled with quick response.

Oxy-Dry Air Knife

The Oxy-Dry Heated Air Knife was designed specifically to compliment the Oxy-Dry Blanket Coater. It will provide two "curtains" of air across the sheet (or web) at velocity up to 4600 ft. per minute. The air is heated by a high efficiency electric heater which can provide temperatures from ambient to 200°F.

**The best Coater on the market is also
the easiest to operate — as simple as...**



As is always the case — the best solution to a problem is the simplest. Dahlgren's 20 years of experience in building Coaters has resulted in the most popular Coater on the market.

The reasons are simple... Dahlgren's single roll Coater:

- ⊗ Applies water base, U.V. and heat seal coatings for a broad range of coating applications — including blister packaging, labels, cartons and commercial printing.
- ⊗ Applies overall or exact pattern coatings.
- ⊗ Easy to operate — 5 minutes maximum makeready; 10 minutes cleanup.
- ⊗ Strong durable construction.
- ⊗ Minimum maintenance due to fewer parts.
- ⊗ Gravure roll hydraulically locks to blanket — eliminates chattering and slinging.
- ⊗ Available for all popular sheet fed presses.
- ⊗ The most competitively priced on the market.

For additional information contact:

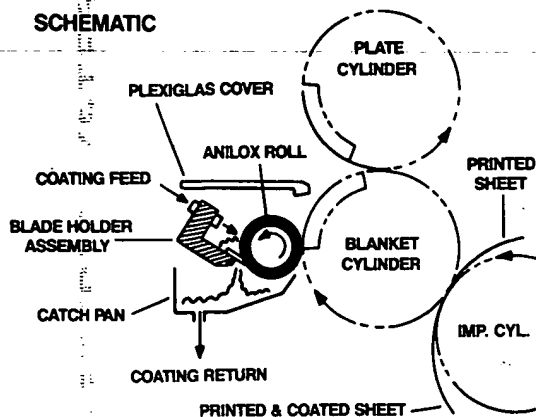
DAHLGREN

3305 MANDOR WAY · DALLAS, TEXAS 75235 214/357-4621 1-800/527-5301
TELEX: 163141

W018919

Product Data DAHLGREN BLANKET COATER

SCHEMATIC



SCHEMATIC DESCRIPTION:

Coating is accomplished with a single gravure roll in pressure contact with an offset press blanket. Coating on the blanket is then applied to the previously wet (or dry) printed sheet. Enroute to the delivery, the sheet is dried with Dahlgren heating lamps and forced air.

A uniform quantity of coating is continuously offered to the press. While the blade removes excess coating from the surface of the roll, engraved cells (voids) on the surface, carry a pre-selected precise volume of coating to the blanket. Coating removed from the cells by the blanket is replenished upon rotation to a flooded-nip at the blade/roll interface. (Coating not removed by the blanket is re-wetted at this nip.) Accumulation, starvation, roll run-out, streaks, etc., are non-existent. The roll is positively driven in both "On" and "Off" positions. Fresh coating is continuously circulated through the coater.

STANDARD FEATURES:

- Rugged, unitized construction for bolt-on adaptation to press frames.

- Horizontal actuation and quick-release retraction from press blanket to remote area of last press unit.

APPLICATOR ROLL ASSEMBLY:

- Heavy wall steel tubing.
- Precision engraved surface (copper, nickel and chrome plated).
- Statically and dynamically balanced.
- Pre-selected volume carrying capacity meeting specific customer coat weight requirements.

- Hydraulically driven at press speed.
- Mounted in heavy-duty, oversized, anti-friction bearings.
- Accurately positioned and hydraulically locked against press mounted "ON" stops.

OTHER FEATURES:

- Rugged blade holder.
- Adjustable pressure capability of blade to coater roll with "Max" pressure limiting stops.
- Flexible, replaceable, "blue-steel", hardened and tempered doctor blade.
- Fixed-angle "wiping" design for doctor blade.
- Coating catch pan under blade holder and coating roll.
- Hinged, clear plexiglas cover over blade holder assembly and coating roll. Serves as bench when cleaning or changing blanket.

- Hydraulic power unit, pre-plumbed and tested with 20 gallon reservoir and 5 H.P. TEFC motor and fixed displacement pump. Flow-control valves for hydraulic motor and actuation cylinders.
- Electrical probes sensing coating flow and level (at coater inlet and in catch pan).
- Operator control station with enclosure and operator devices, with digital "FPM" readout.
- "NEMA 12" power control cabinet with control circuit isolation transformer.

CIRCULATION SYSTEM:

- Feed and return, constant displacement pump.
- Variable speed air-motor drive to pump.
- Positive drain and return of coating to drum.

- Quick-disconnects at coater head, catch pan and supply drum.
- Quick-disconnects for customer furnished wash-up lines.
- 3/4" I.D. flexible, vinyl tubing.

OPTIONAL EQUIPMENT:

- Custom designed coater retraction systems.

- Custom designed coating circulation systems.

ELECTRICAL/PNEUMATIC INPUT REQUIREMENTS:

Standard: 230 VAC \pm 10%, 3-phase, 60 Hz, 25 Amps (10 KVA) Load

Optional: 460 VAC \pm 5%, 3-phase, 60 Hz, 15 Amps (12 KVA) Load
380 VAC \pm 5%, 3-phase, 50 Hz, 15 Amps, (10 KVA) Load

SHEET-FED PRESSES DESIGNED FOR:

AURELIA
BOBST
COLOR METAL
CRABTREE
HALM

HARRIS
HEIDELBERG
KOMORI
M.A.N.
MANN

MARINONI
MIEHLE
MILLER
MITSUBISHI
NEBIOLO

O.M.C.S.A.
PLANETA (ROYAL ZENITH)
SOLNA
OTHERS

WARRANTY SERVICE:

- Installation and start-up supervision
- 6 months gravure roll warranty

- 90 day service warranty
- 12 months — other parts warranty

PATENTS PENDING

DAHLGREN

DAHLGREN U.S.A., P.O. BOX 36305, DALLAS, TEXAS 75235
TEL: (214) 630-3234, WATS: 800-527-5301, TLX: 163141

W018920

09315796.052501

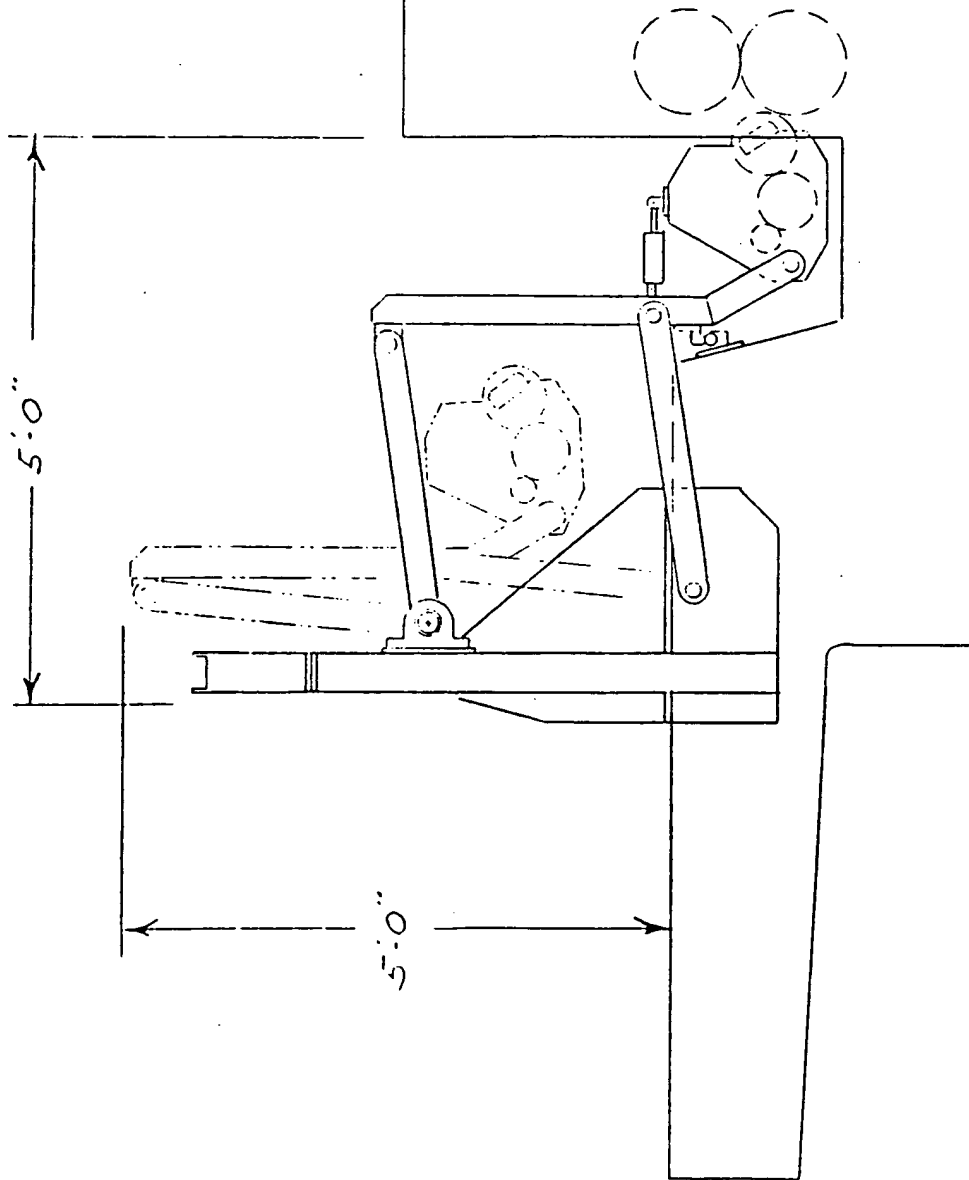


W018922

FORM 9525T60

PRESS	REMOVAL SYSTEM	RAPIDAC BLANKET COATER MODEL NO.	SPARE ROLLS PART NOS.		
			APPLICATOR	PICKUP	METERING
Miller 41"	Yes	A-2002	D-2000-1-1	D-2000-2-1	D-2000-3-1
Heidelberg 40"	Yes	A-2003	D-2000-1-2	D-2000-2-2	D-2000-3-2
Komori 40"	Yes	A-2006	D-2000-1-2	D-2000-2-2	D-2000-3-2
Planeta 40"	Yes	A-2009	D-2000-1-2	D-2000-2-2	D-2000-3-2
Planeta 50"	Yes	A-2012	D-2022-1-4	D-2022-2-4	D-2022-3-4
Planeta 55"	Yes	A-2015	D-2022-1-3	D-2022-2-3	D-2022-3-3
Planeta 64"	Yes	A-2018	D-2022-1-2	D-2022-2-2	D-2022-3-2
Miehle 60"	Yes	A-2021	D-2022-1-1	D-2022-2-1	D-2022-3-1
Harris 60"	Yes	A-2024	D-2022-1-1	D-2022-2-1	D-2022-3-1
Harris 60"	Yes	A-2028	D-2022-1-1	D-2022-2-1	D-2022-3-1
Harris 60"	Yes	A-2029	D-2022-1-1	D-2022-2-1	D-2022-3-1
Planeta 50"	No	A-2031	D-2032-1-1	D-2032-2-1	D-2032-3-1
Planeta 55"	No	A-2033	D-2032-1-2	D-2032-2-2	D-2032-3-2
Planeta 64"	No	A-2035	D-2032-1-3	D-2032-2-3	D-2032-3-3
Harris 60"	No	A-2037	D-2032-1-4	D-2032-2-4	D-2032-3-4
Crabtree 50.5"	No	A-2039	D-2040-1-1	D-2040-2-1	D-2040-3-1

TOP VIEW



RAPIDAC BLANKET COATER

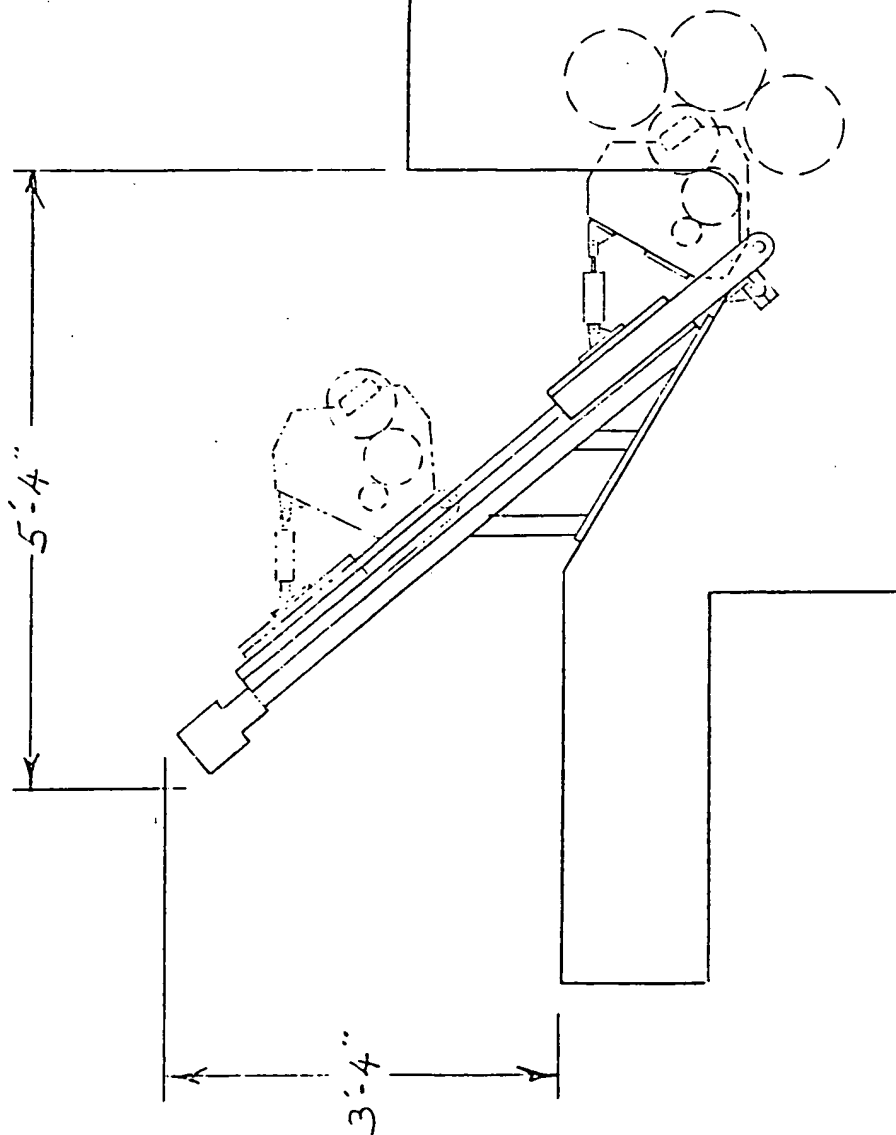
MODEL NO. A-2002

PRESS

MILLER 41"

W018924

FD5250" 96/STEE60



RAPIDAC BLANKET COATER

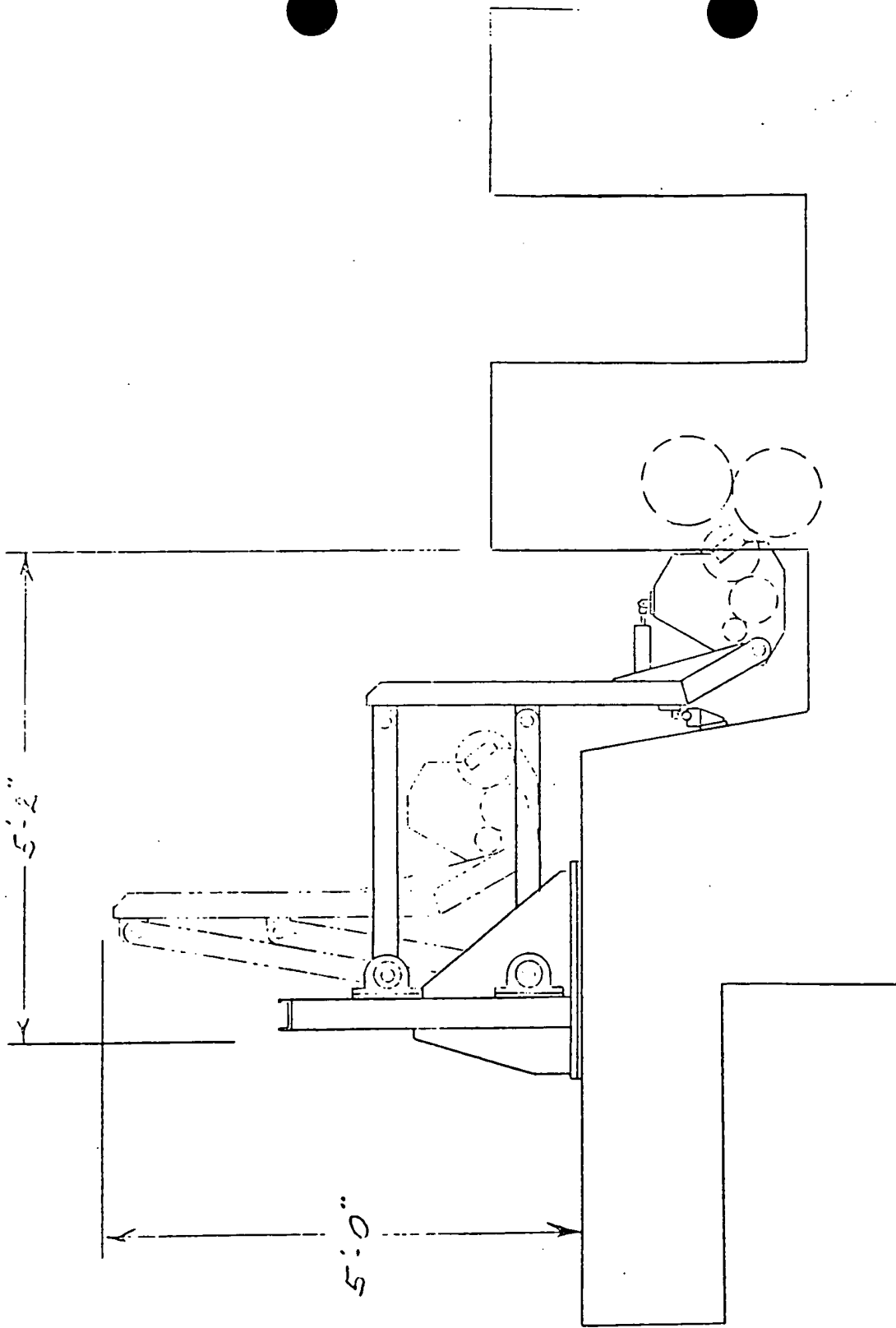
PRESS

MODEL NO. A-2003

HEIDELBERG 40"

W018925

105250" 95/5757560



RAPIDAC BLANKET COATER

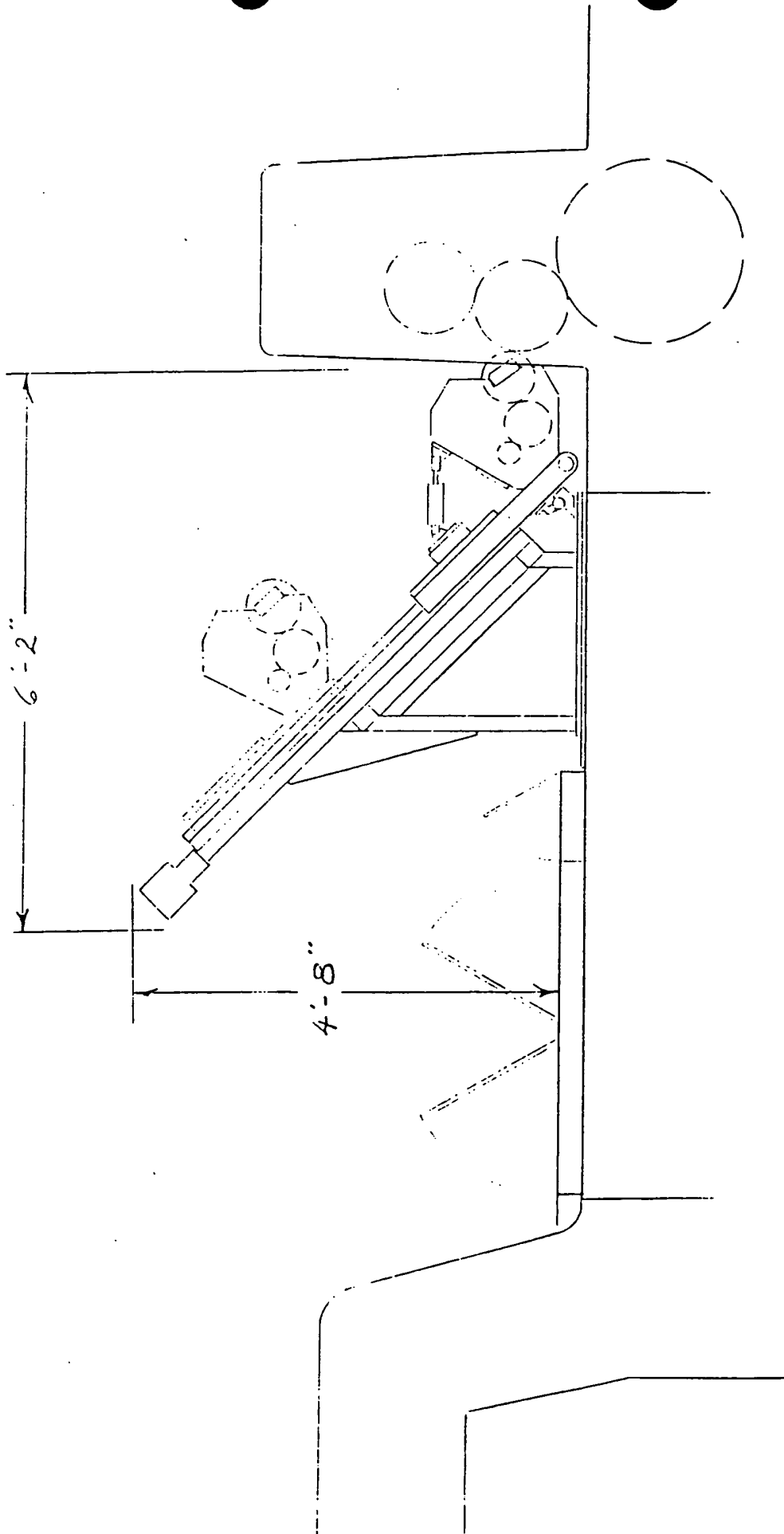
MODEL NO. A-2006

PRESS

KONORI 40"

W018926

TOPPED SHEETED



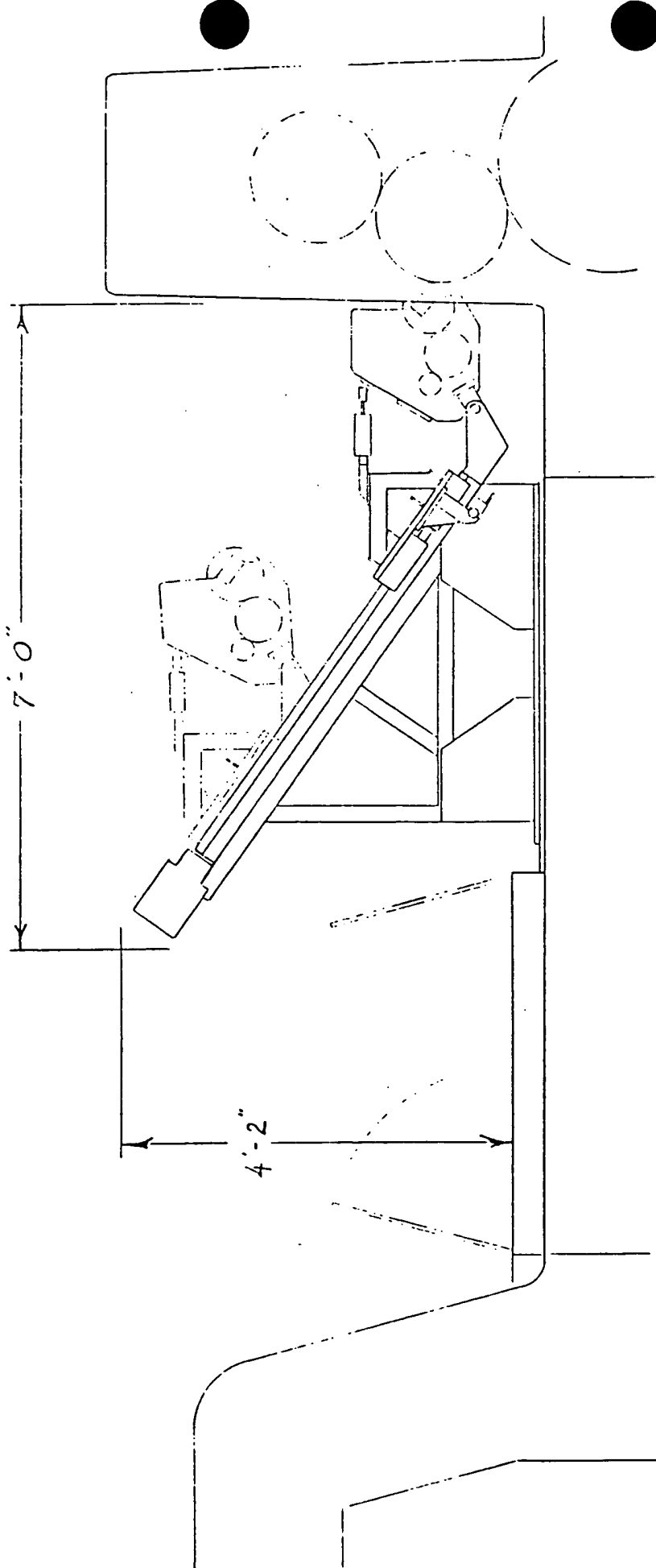
PRESS RAPIDAC BLANKET COATER

PLANETA 40"
MODEL NO. A-2009

WITH EXTENDED DELIVERY

W018927

FORM 96-50



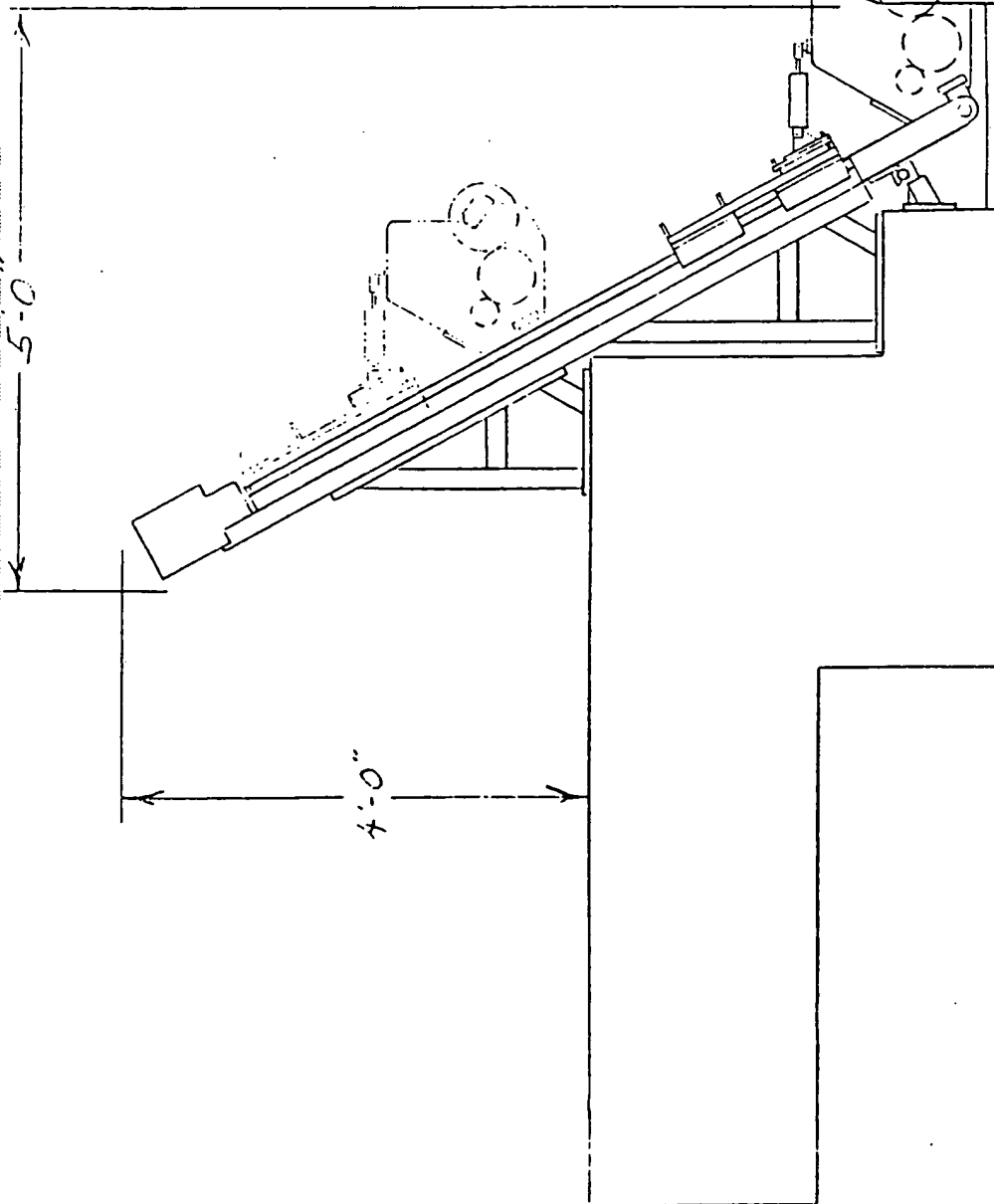
RAPIDAC BLANKET COATER

MODEL NO. A-2012
MODEL NO. A-2015
MODEL NO. A-2018

PRESS

PLANETA 50" WITH EXTENDED DELIVERY
PLANETA 55" WITH EXTENDED DELIVERY
PLANETA 64" WITH EXTENDED DELIVERY

4'-0" 364,576.0

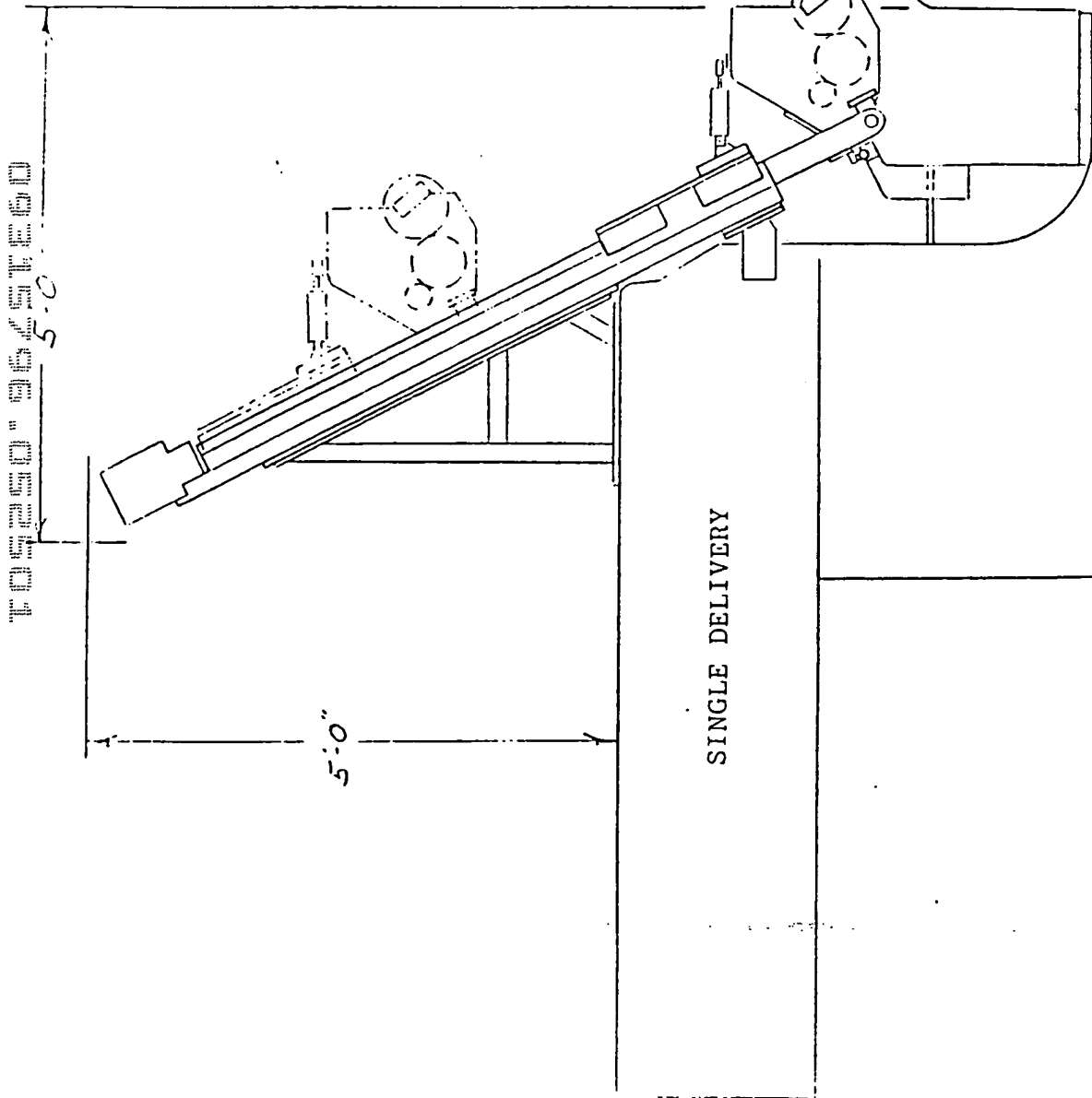


RAPIDAC BLANKET COATER

PRESS

MODEL NO. A-2021

MIEHLE 60"



5'-0" 5'-0"

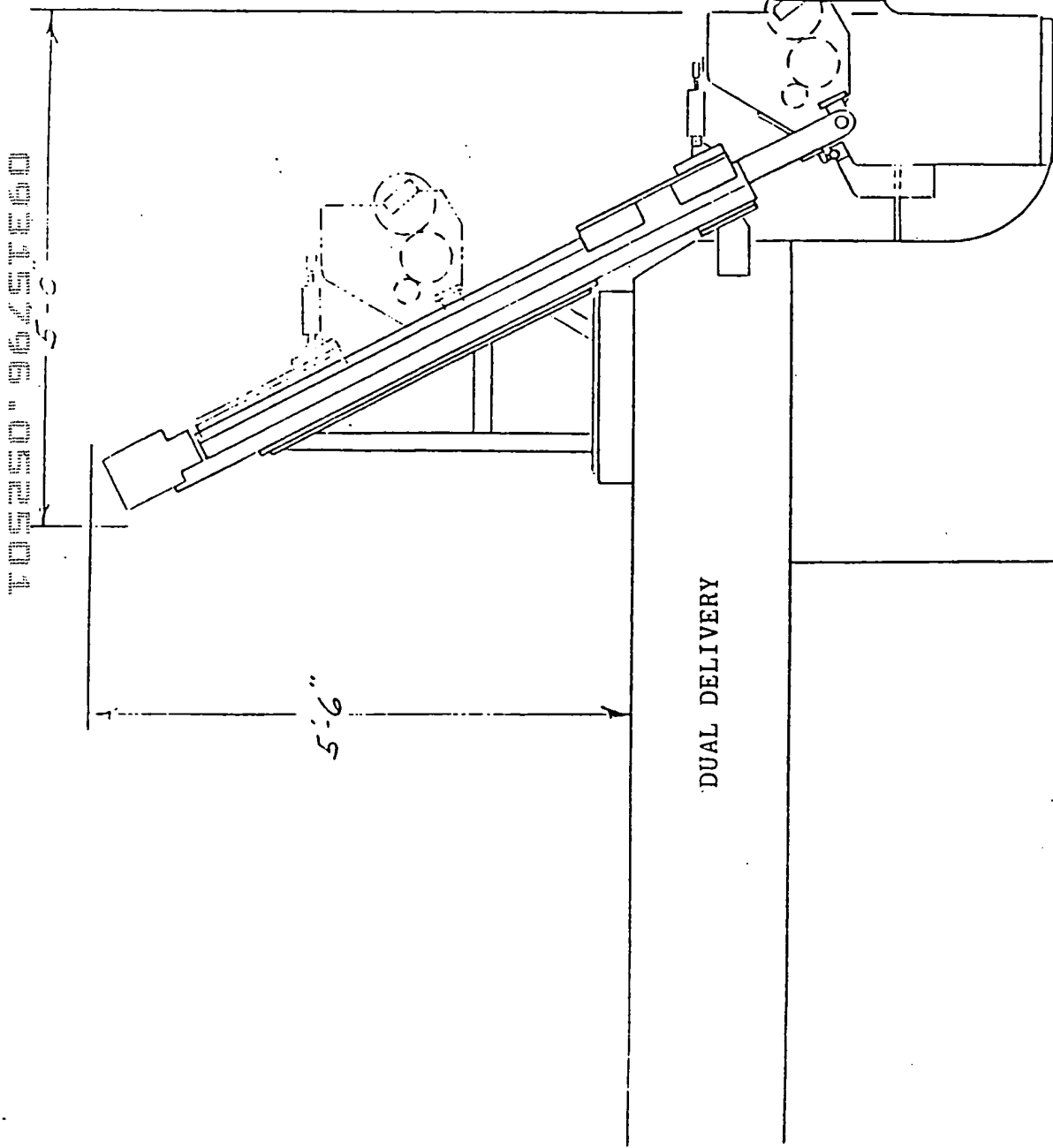
SINGLE DELIVERY

PRESS

RAPIDAC BLANKET COATER

HARRIS 60" EARLY MODEL (SINGLE DELIVERY)

MODEL NO. A-2024



TOSSO" 96ZSTEEB

5'-6"

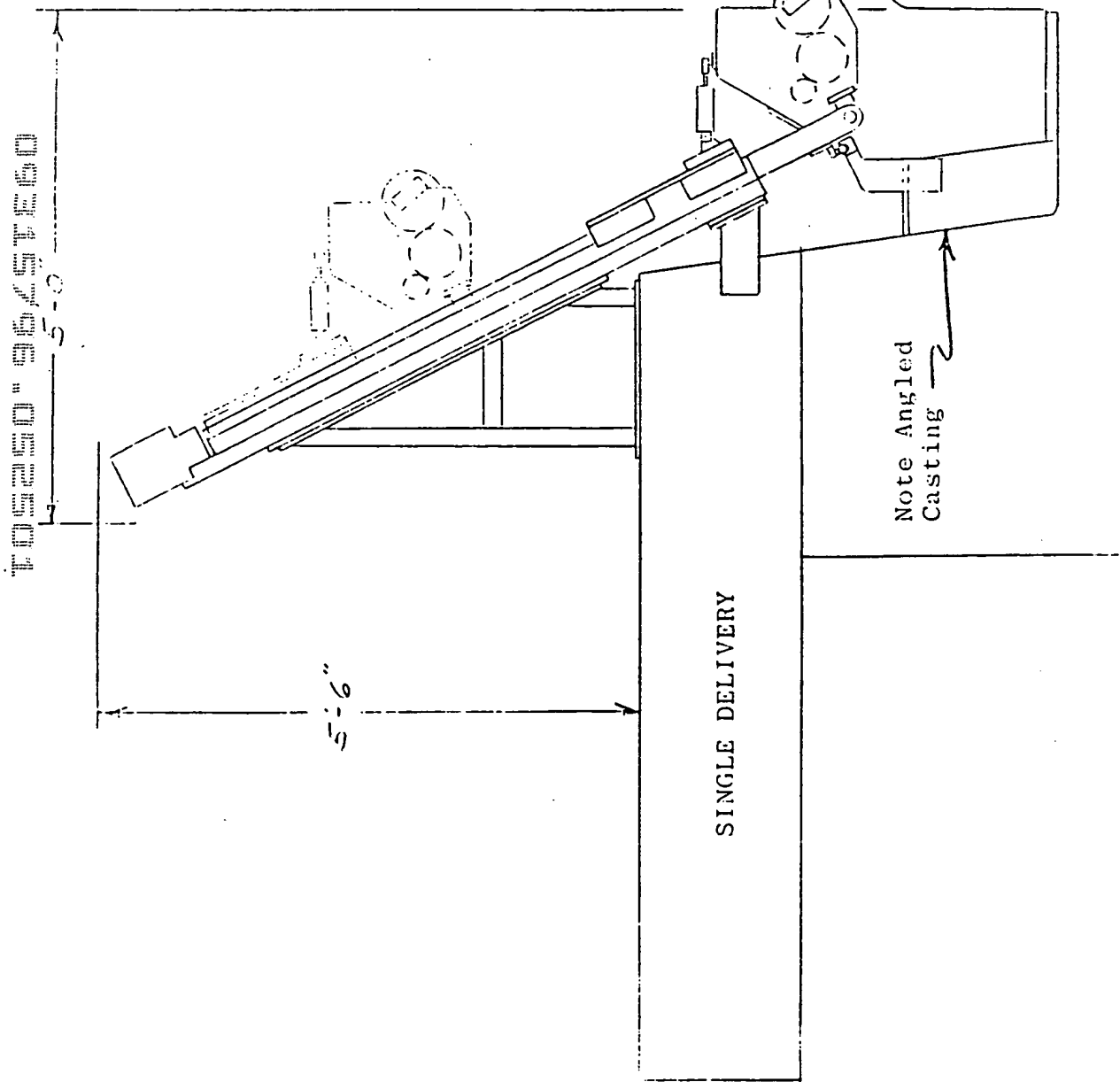
DUAL DELIVERY

RAPIDAC BLANKET COATER

MODEL NO. A-2028

PRESS

HARRIS 60" EARLY MODEL (DUAL DELIVERY)



PRESS

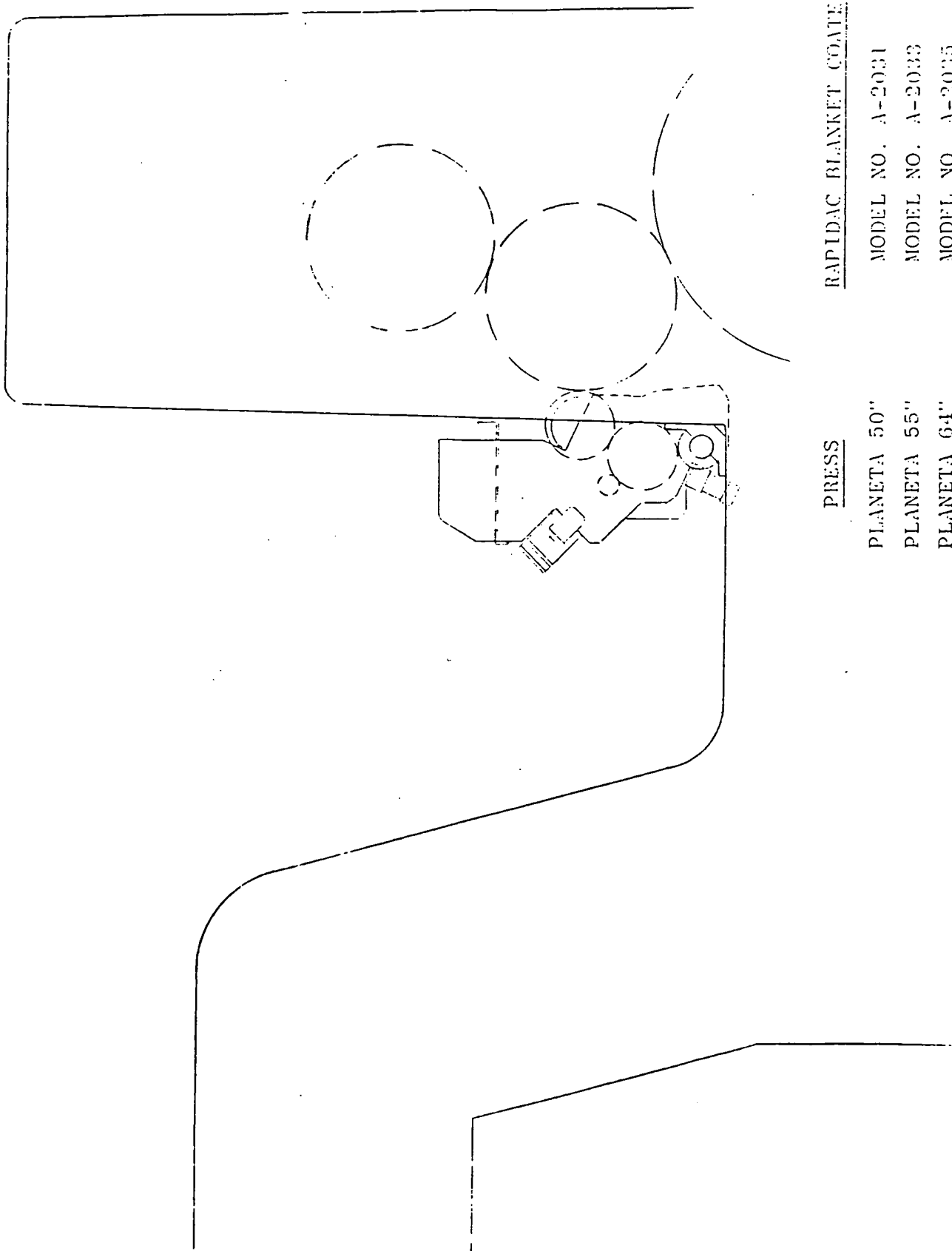
RAPIDAC BLANKET COATER

HARRIS 60" LATE MODEL (SINGLE DELIVERY)

MODEL NO. A-2029

W018932

705250" 96457E60



RAPIDAC BLANKET COATER

PRESS

PLANETA 50"	MODEL NO. A-2031
PLANETA 55"	MODEL NO. A-2033
PLANETA 64"	MODEL NO. A-2035

DAHLGREN

Product Data Bulletin

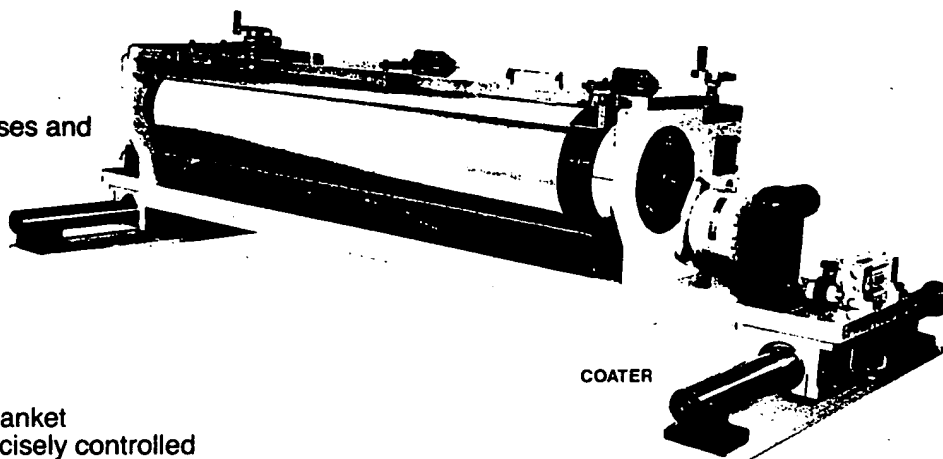
Blanket Coater

FOR:

The coater is designed for retrofit on new or existing offset SHEET-FED presses and may be used for both in-line (wet-trap) as well as off-line (dry trap) applications.

The Blanket Coating unit is used in conjunction with the last printing station of the offset press to apply protective, high gloss and blister seal coatings over wet or dry surfaces, with optimum efficiency.

Coatings are delivered to the offset blanket directly from a gravure cylinder in precisely controlled amounts and then transferred to the substrate with a high level of uniformity and consistency.

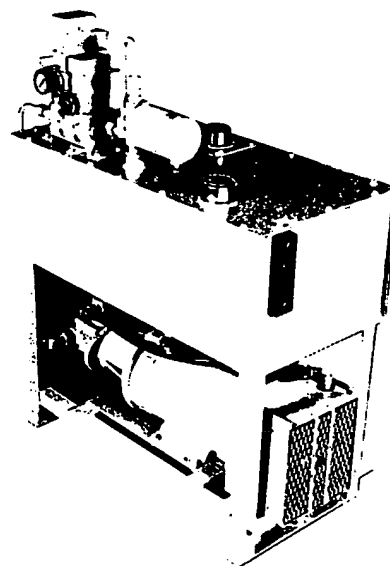


COATER

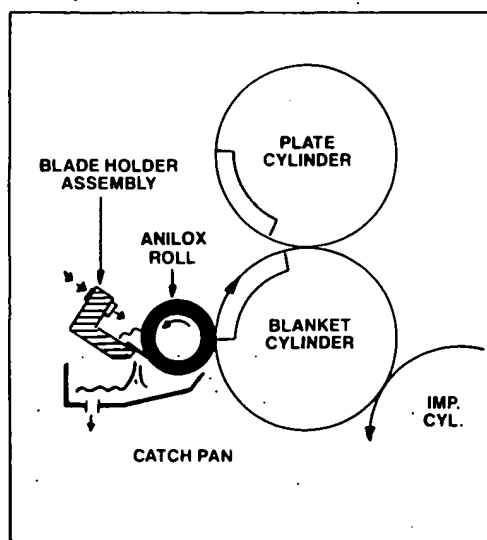
DOMESTIC AND FOREIGN
PATENTS ISSUED AND PENDING

Various types of coatings can be used interchangeably with the coater including aqueous and U.V. curables. Substrates of varying nature such as paperboard and plastics may also be used.

The entire Coating System consists of the coater, coating supply and circulating system, plus a drying system. (See separate data sheets for dryers.)



HYDRAULIC
DRIVE UNIT



SCHEMATIC DESCRIPTION:

Coating is accomplished with a single gravure roll in pressure contact with an offset press blanket. Coating on the blanket is then applied to the previously wet (or dry) printed sheet. Enroute to the delivery, the sheet is dried with Dahlgren heating lamps and forced air.

A uniform quantity of coating is continuously offered to the press. While the blade removes excess coating from the surface of the roll, engraved cells (voids) on the surface, carry a pre-selected precise volume of coating to the blanket. Coating removed from the cells by the blanket are replenished upon rotation to a flooded-nip at the blade/roll interface. Coating not removed by the blanket is re-wetted at this nip. Accumulation, starvation, roll run-out, streaks, etc., are non-existent. The roll is positively driven in both "On" and "Off" positions. Fresh coating is continuously circulated through the coater. Coat weight may be varied by varying the speed of the anilox roll.

W018935

STANDARD FEATURES

- Rugged, unitized construction for bolt-on adaptation to press frames. Horizontal actuation and retraction from press blanket.

APPLICATOR ROLL ASSEMBLY:

- Precision engraved surface (copper, nickel and chrome plated).
- Statically and dynamically balanced.
- Pre-selected volume carrying capacity meeting specific customer coat weight requirements.
- Hydraulically driven at press speed for spot-coating, or, at varying speeds for overall coating.
- Mounted in heavy-duty, oversized, anti-friction bearings.
- Accurately positioned and positively forced (locked) against press mounted "ON" stops. Automatic on-off w/press impression circuit.

DOCTOR BLADE HOLDER ASSEMBLY:

- Cast iron holder.
- Adjustable pressure capability of blade to coater roll with "Max" pressure limiting stops.
- Flexible, replaceable, "blue-steel", hardened and tempered doctor blade; ground doctor surface.
- Fixed-angle "wiping" design for doctor blade.
- Coating catch pan under blade holder and coating roll.
- Electrical probes sensing coating flow and level at coater inlet and in catch pan.
- Hinged, aluminum tread plate over blade holder assembly and coating roll. Serves as bench when cleaning or changing blanket.
- Hydraulic power unit, pre-plumbed and tested with 20 gallon reservoir and 5 H.P., TEFC motor and fixed displacement pump.
- Flow-control valves for hydraulic motor and actuation cylinders at coater unit.
- Unit control station with oil-tight enclosure and operator devices.
- "NEMA 12" power control cabinet with control circuit isolation transformer.

CIRCULATION SYSTEM:

- Feed and return, constant displacement pumps.
- Variable air drive to pumps.
- Positive drain and return of coating to drum.
- Quick-disconnects at coater head, catch pan and supply drum.
- Quick-disconnects for customer furnished wash-up lines.
- ¾" I.D. flexible, vinyl tubing.

BENEFITS:

- System performance (coater + dryer) guarantees.
- Operational simplicity, low maintenance, long life, safe.
- Short make-ready and clean-up.
- Ready access to press blanket when coater is not in use.
- Applies precise, consistent quantity of coating; repeatable.
- Coating is smooth, uniform and has high rub resistance and gloss.
- Elimination of spray powder and associated problems.
- Positive "ON", no bounce in cylinder gap (streak-free).

OPTIONAL EQUIPMENT:

- Custom designed coater retraction systems/patented
- Custom designed coating circulation systems
- Viscosity monitor and control
- Ratio speed meter modification

ELECTRICAL/PNEUMATIC INPUT REQUIREMENTS:

230 VAC \pm 10%, 3 PHASE, 50/60 HZ \pm 2 HZ (25 amps:10 KVA)
400 VAC \pm 5%, 3 PHASE, 50 HZ \pm 2 HZ (15 amps:10 KVA)

460 VAC \pm 10%, 3 PHASE, 60 HZ \pm 2 HZ (15 amps:12 KVA)
85-100 PSI Air Pressure; 120 PSI, max.

SHEET-FED PRESSES DESIGNED FOR:

Aurelia
Bobst
Color Metal
Crabtree
Halm

Harris
Heidelberg
Komori
M.A.N.
Mann

Marinoni
Miehle
Miller
Mitsubishi
Nebiolo

O.M.C.S.A.
Planeta (Royal Zenith)
Solna
Miehle/Roland (I/C)

WARRANTY SERVICE:

Installation and start-up supervision • 90 day service warranty • 6 months gravure roll warranty • 12 months—other parts warranty

Dahlgren USA, Inc.

P.O. Box 115140

Carrollton, Tx 75011-5140

tel: (214) 245-0035 • wats: 800/527-5301 • fax: (214) 245-0768

W018936

**What would you say if we told you
you could get 5 impressions
out of your 4-color press?**

09345796-052501



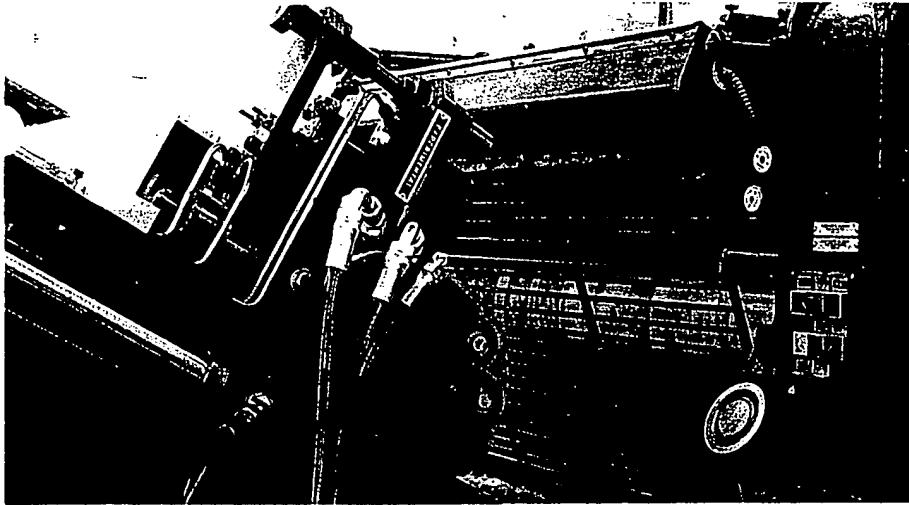
W018938

Believe it!



**Dahlgren's new LithoPlus™ Coating System
gives you an extra impression on your
2, 4, 5 and 6-color Heidelberg Speedmaster!**

W018939



It sounds incredible. And it should! Until now, no one has been able to print and coat in a single pass, without giving up a station. That is, until Dahlgren introduced its new LithoPlus Coating System, designed specifically for the Heidelberg Speedmaster press.

In simplest terms, the Dahlgren LithoPlus Coating System is an add-on blanket cylinder that fits onto the last printing station of your Speedmaster press. With it, you can print and coat in-line, for overall or spot coverage, using U.V., aqueous or varnish coatings. Your customers get added gloss and scuff resistance. Your pressroom dramatically reduces spray powder usage and turnaround time. You save press time, floor space and money.

What's more, you can bill the premium price coating jobs demand, while completing the work in a single pass for better quality. Savings. Quality. Profits. Why hasn't anyone thought of this before?

How the patented Dahlgren LithoPlus Coating System works.

The Dahlgren LithoPlus Coating System was engineered to function as an addition to your Heidelberg Speedmaster press. It is solid, well-designed and compatible with any 40", 28" or CD model. And once it's in place, it never needs to be removed. Just retract the unit when you're not using it, move it back when you're ready to coat. Clean-up and set-up take only a few minutes.

The coater is held in place using a combination of electromagnets and hydraulics, against positive, adjustable stops, that prevent chattering and bouncing. The unit's safe, aluminum add-on cylinder is geared directly to your press, with electrical interlocks to assure proper alignment. When the press and system

are turned on, gears drive the coater in synchronization with your press, allowing you to run at full production speeds. Coating and drying occur after the last color application, and coat weight can be varied as desired.

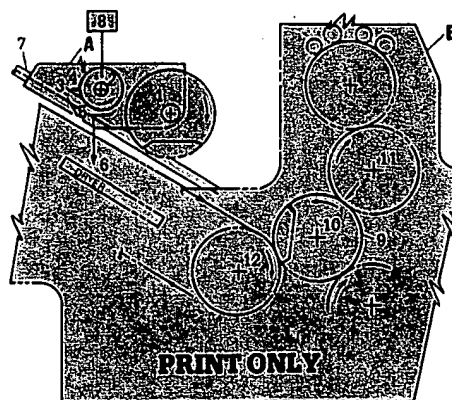
Custom-engineered installation by trained Dahlgren technicians is included in your LithoPlus Coating System purchase. We ensure that your installation meets the precise tolerances of your press. We'll train your people to use the system according to your specifications. And

slinging, streaking, ridging or unnecessary orange peeling. When you run a Dahlgren, you get total control.

Schematic Description:

Coating is accomplished with a single engraved roll in pressure contact with an add-on coating blanket cylinder. Coating on the coating cylinder is then applied to the previously wet (or dry) printed sheet. Enroute to the delivery, the sheet is dried with a Dahlgren drying system and forced air.

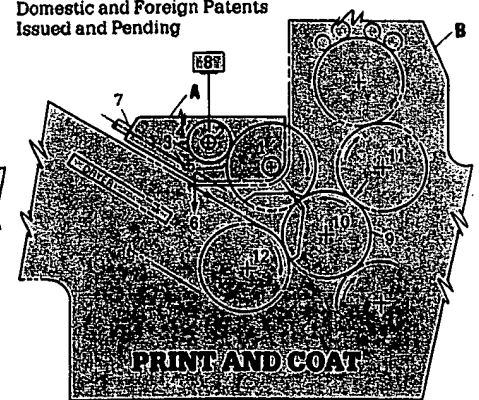
A uniform quantity of coating is continuously offered to the coating cylinder and sheet. While the blade removes excess coating from the surface of the roll, engraved cells (voids) on the surface, carry a pre-selected, precise volume of coating to the coating cylinder blanket. Coating removed from the cells by the coating blanket are replenished upon rotation to a flooded-nip at the blade/roll interface. Coating not removed by the blanket is re-wetted at this nip. Accumulation, starvation, roll run-out, and streaks, are non-existent. The coating roll is positively driven in both "on" and "off" positions and can be varied as required. Fresh coating is continuously circulated through the coater.



A. COATING MODULE

- | | |
|-------------------------|-----------------------------|
| 1. COATING CYL. | 5. COATING CATCH PAN |
| 2. ANILOX ROLL | 6. COATING CIRCULATION SYS. |
| 3. BLADE | 7. RETRACTION SYS. |
| 4. COATING (AQUEOUS-UV) | |

Domestic and Foreign Patents Issued and Pending



B. PRESS

- | | |
|--|-------------------------|
| 8. CONTROL STA. & VARIABLE SPEED DRIVE | 9. SHEET |
| | 10. IMPRESSION CYL. |
| | 11. BLANKET CYL. |
| | 12. SHEET TRANSFER SYS. |

like all Dahlgren products, the LithoPlus Coating System is guaranteed or your money back.

Dahlgren coaters deliver consistent quality, sheet after sheet at your production speeds.

Whether you're running paper, board or virtually any other substrate, your Dahlgren coater will provide uniform coating over your entire run. No

See for yourself. Call Dahlgren today!

As a Heidelberg Speedmaster owner you can't afford not to investigate the benefits of Dahlgren's new LithoPlus Coating System. It saves time. It improves the quality of your work. It can make you money.

For information, contact Dahlgren toll-free at 1-800-527-5301 ext. 128 today. Seeing is believing. The LithoPlus Coating System is here!

Dahlgren LithoPlus™ Coating System

Benefits:

- System performance (coater + dryer) guaranteed to your specification. Operational simplicity, low maintenance, long life, safe.
- Short make-ready and clean-up.
- Ready access to press when coater is not in use.
- Applies precise, consistent quantity of coating; repeatable.
- Coating is smooth and uniform.
- Reduction of spray powder and associated problems.
- Positive "on" no bounce in cylinder gap (streak-free).

System Integration:

- Rugged, unitized construction for bolt-on adaptation to press frames. Hydraulic actuation to and retraction from the press impression cylinder.

Coating Cylinder Assembly:

- Synchronized drive from press.
- Electro/magnetic start up safety provisions.
- Durable construction.
- Adaptable for blankets or photopolymer plate.
- Provision for plate registration.

Applicator Roller Assembly:

- Precision engraved surface (copper, nickel and chrome plated).
- Statically and dynamically balanced
- Pre-selected maximum volume carrying capacity meeting specific customer coat weight requirements.
- Hydraulically driven at press speed for spot coating or variable speeds for varying overall coat weights.
- Mounted in heavy-duty, oversized, anti-friction bearings.
- Accurately positioned and actuated against adjustable "on" stops to coating cylinder.

Doctor Blade Holder Assembly:

- Adjustable pressure capability of blade to coater roll with "Max" pressure limiting stops.
- Flexible, replaceable, "blue-steel," hardened, tempered and ground doctor blade.
- Fixed-angle "wiping" design for doctor blade.

Circulation System:

- Feed and return, constant displacement pumps.
- Variable speed air-motor drive to each pump.
- Positive drain and return of coating to drum.
- Quick-disconnects at coater head, catch pan and supply drum.
- Quick-disconnects for customer furnished wash-up lines.
- 1/4" I.D. flexible, vinyl tubing.
- Liquid level high/low controls.

Other Features:

- Coating catch pan under blade holder and coating roll.
- Electrical detectors sense coating flow and level at coater inlet and in catch pan.
- Hinged, clear plexiglas cover over blade holder assembly and coating roll.
- Hydraulic power unit, pre-plumbed and tested with 20 gallon reservoir and 5 H.P., TEFC motor and fixed displacement pump. Flow-control valves for hydraulic motor and actuation cylinders at coater unit.
- Unit control station with oil-tight enclosure and operator devices.
- "NEMA 12" power control cabinet with control circuit isolation transformer.

Optional Equipment:

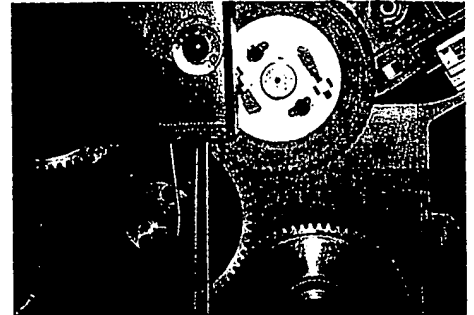
- Custom designed coating circulation systems.

Electrical/Pneumatic Input Requirements:

- 460 +/- 10% volts AC 3Ø, 60 Hz, 15 amp (12 KVA) Load.
- 230 +/- 10% volts AC, 3Ø, 50-60 +/- Hz, 25 amps (10 KVA) Load.
- 85-100 PSI Air Pressure; 120 PSI, max.

Warranty Service:

- Installation and start-up supervision.
- 90-day service warranty.
- 6 months anilox roll warranty.
- 12 months all other parts warranty.



Printed four colors plus coating in one pass on a four color Heidelberg Speedmaster equipped with a LithoPlus Coater and Dahlgren Dampeners using Sinclair and Valentine inks and Algan coating. Cyrel® photo polymer plate furnished by DuPont.

(214) 245-0035
P.O. Box 115140 Carrollton, TX 75011

Call Toll-Free 1-800-527-5301 ext. 128

One roll outshines them all.

DAHLGREN

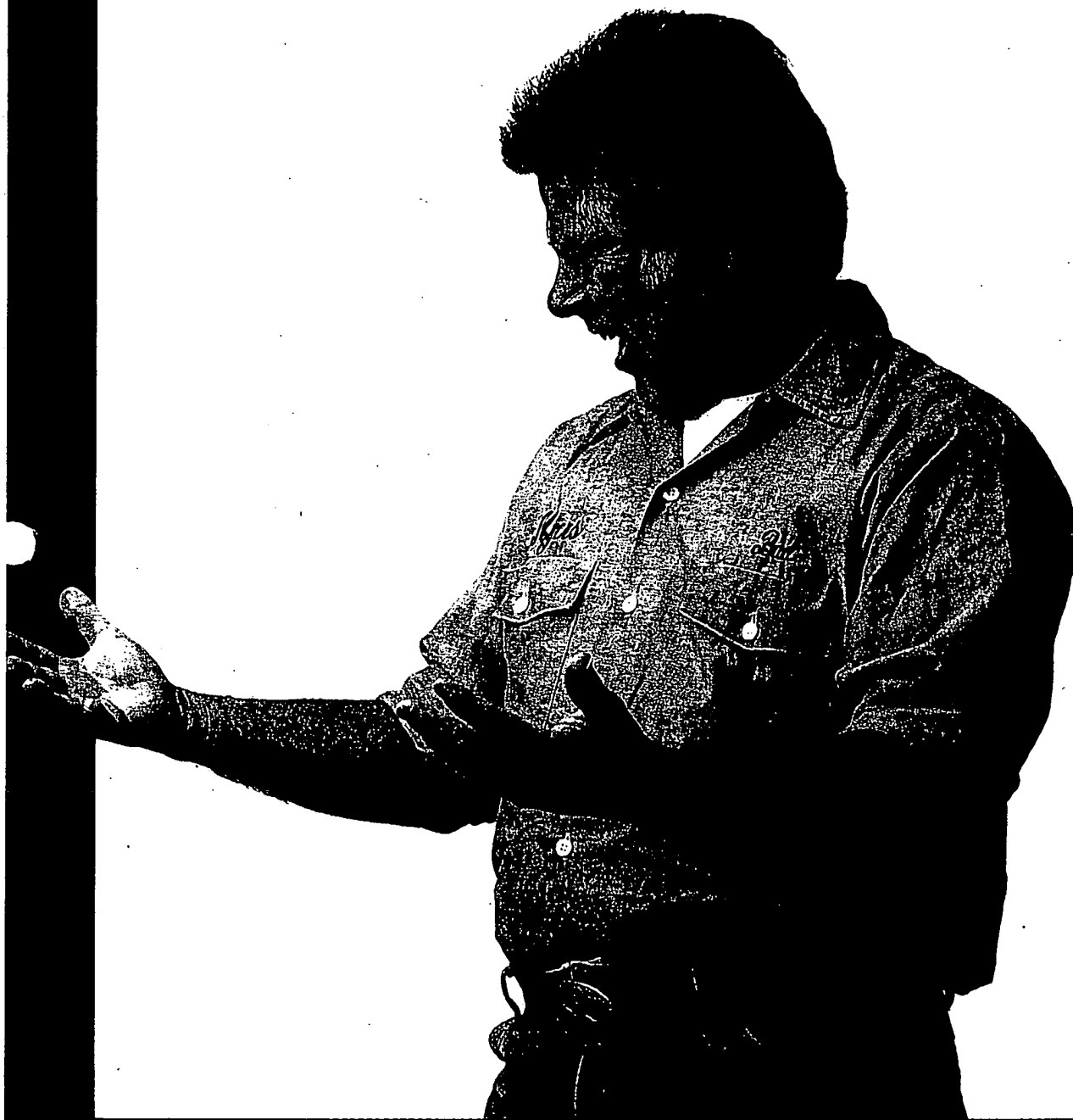
**What would you say if we told you
you could get 5 impressions
out of your 4-color press?**

09315796-052501



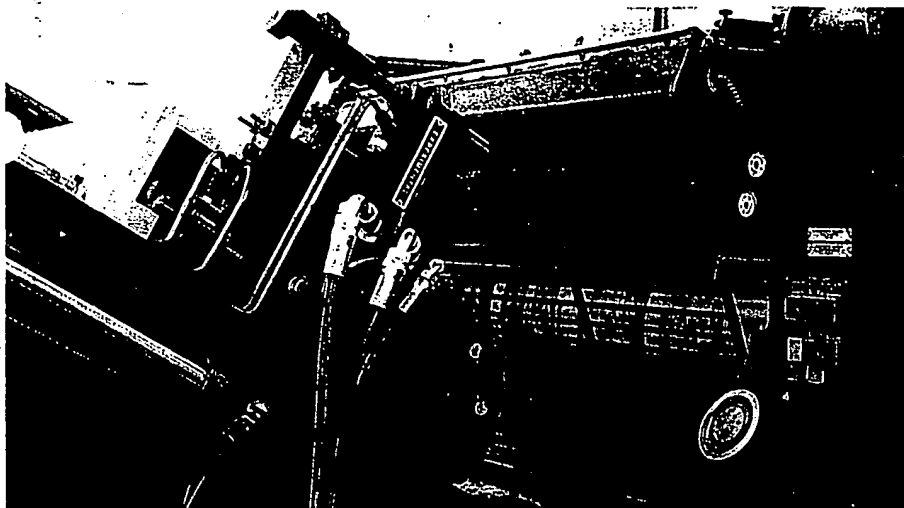
W018943

Believe it!



**Dahlgren's new LithoPlus[™] Coating System
gives you an extra impression on your
2, 4, 5 and 6-color Heidelberg Speedmaster!**

W018944



It sounds incredible. And it should! Until now, no one has been able to print and coat in a single pass, without giving up a station. That is, until Dahlgren introduced its new LithoPlus Coating System, designed specifically for the Heidelberg Speedmaster press.

In simplest terms, the Dahlgren LithoPlus Coating System is an add-on blanket cylinder that fits onto the last printing station of your Speedmaster press. With it, you can print and coat in-line, for overall or spot coverage, using U.V., aqueous or varnish coatings. Your customers get added gloss and scuff resistance. Your pressroom dramatically reduces spray powder usage and turnaround time. You save press time, floor space and money.

What's more, you can bill the premium price coating jobs demand, while completing the work in a single pass for better quality. Savings. Quality. Profits. Why hasn't anyone thought of this before?

How the patented Dahlgren LithoPlus Coating System works.

The Dahlgren LithoPlus Coating System was engineered to function as an addition to your Heidelberg Speedmaster press. It is solid, well-designed and compatible with any 40", 28" or CD model. And once it's in place, it never needs to be removed. Just retract the unit when you're not using it, move it back when you're ready to coat. Clean-up and set-up take only a few minutes.

The coater is held in place using a combination of electromagnets and hydraulics, against positive, adjustable stops, that prevent chattering and bouncing. The unit's safe, aluminum add-on cylinder is geared directly to your press, with electrical interlocks to assure proper alignment. When the press and system

are turned on, gears drive the coater in synchronization with your press, allowing you to run at full production speeds. Coating and drying occur after the last color application, and coat weight can be varied as desired.

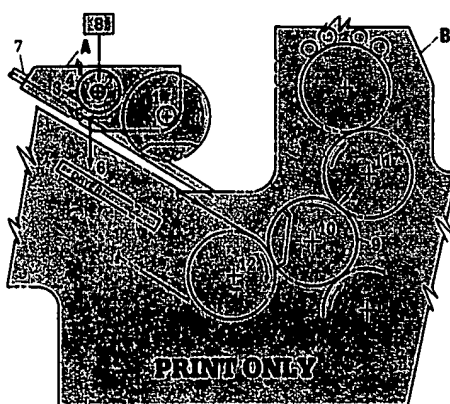
Custom-engineered installation by trained Dahlgren technicians is included in your LithoPlus Coating System purchase. We ensure that your installation meets the precise tolerances of your press. We'll train your people to use the system according to your specifications. And

slinging, streaking, ridging or unnecessary orange peeling. When you run a Dahlgren, you get total control.

Schematic Description:

Coating is accomplished with a single engraved roll in pressure contact with an add-on coating blanket cylinder. Coating on the coating cylinder is then applied to the previously wet (or dry) printed sheet. Enroute to the delivery, the sheet is dried with a Dahlgren drying system and forced air.

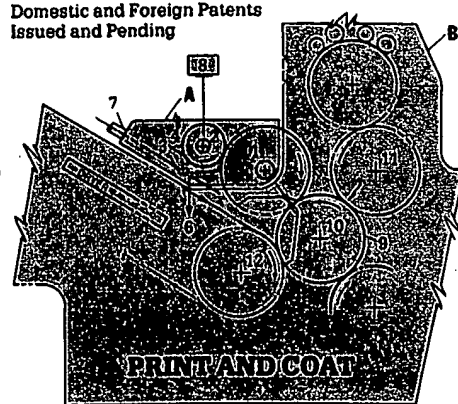
A uniform quantity of coating is continuously offered to the coating cylinder and sheet. While the blade removes excess coating from the surface of the roll, engraved cells (voids) on the surface, carry a pre-selected, precise volume of coating to the coating cylinder blanket. Coating removed from the cells by the coating blanket are replenished upon rotation to a flooded-nip at the blade/roll interface. Coating not removed by the blanket is re-wetted at this nip. Accumulation, starvation, roll run-out, and streaks, are non-existent. The coating roll is positively driven in both "on" and "off" positions and can be varied as required. Fresh coating is continuously circulated through the coater.



A. COATING MODULE

1. COATING CYL.
2. ANILOX ROLL
3. BLADE
4. COATING (AQUEOUS-UV)
5. COATING CATCH PAN
6. COATING CIRCULATION SYS.
7. RETRACTION SYS.

Domestic and Foreign Patents Issued and Pending



B. PRESS

8. CONTROL STA. & VARIABLE SPEED DRIVE
9. SHEET
10. IMPRESSION CYL.
11. BLANKET CYL.
12. SHEET TRANSFER SYS.

like all Dahlgren products, the LithoPlus Coating System is guaranteed or your money back.

Dahlgren coaters deliver consistent quality, sheet after sheet at your production speeds.

Whether you're running paper, board or virtually any other substrate, your Dahlgren coater will provide uniform coating over your entire run. No

See for yourself. Call Dahlgren today!

As a Heidelberg Speedmaster owner you can't afford not to investigate the benefits of Dahlgren's new LithoPlus Coating System. It saves time. It improves the quality of your work. It can make you money.

For information, contact Dahlgren toll-free at 1-800-527-5301 ext. 128 today. Seeing is believing. The LithoPlus Coating System is here!

Dahlgren LithoPlus™ Coating System

Benefits:

- System performance (coater + dryer) guaranteed to your specification.
- Operational simplicity, low maintenance, long life, safe.
- Short make-ready and clean-up.
- Ready access to press when coater is not in use.
- Applies precise, consistent quantity of coating; repeatable.
- Coating is smooth and uniform.
- Reduction of spray powder and associated problems.
- Positive "on" no bounce in cylinder gap (streak-free).

System Integration:

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- Unit control station with oil-tight enclosure and operator devices.
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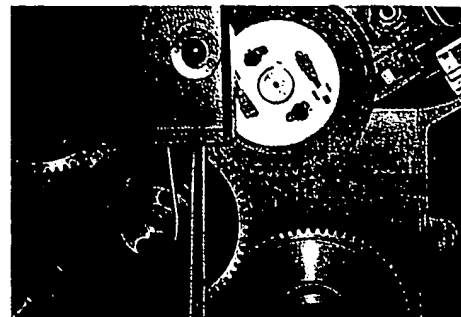
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Printed four colors plus coating in one pass on a four color Heidelberg Speedmaster equipped with a LithoPlus Coater and Dahlgren Dampeners using Sinclair and Valentine inks and Algan coating.

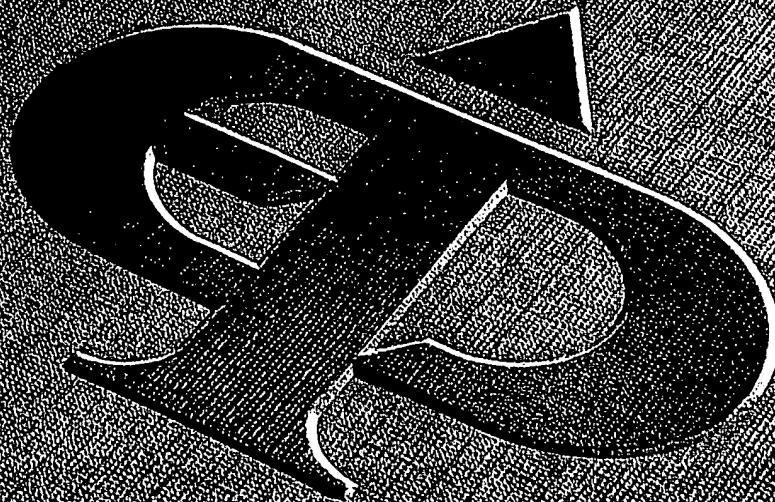
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P.O. Box 115140 Carrollton, TX 75011

Call Toll-Free 1-800-527-5301 ext. 128

One roll outshines them all.

DAHLGREN

Epic Products



Technology for a lasting impression

W018948



Epic

Technology for a Lasting Impression

The Epic Commitment

Epic Products International Corporation is an engineering and manufacturing organization committed to developing printing press accessory equipment that enhances the quality and productivity of the printing process. In striving to improve printing techniques through advanced designs, we have formed the state of the art of the printing industry. Our patented Delta technology, which removes debris from the plate cylinder during printing, reduces nicks and other visual defects. It is a mark of our continuing dedication to providing a lasting impression.

Our repertoire of quality enhancing continuous printing systems, coating systems and drying systems for offset and web presses, as well as the capability to integrate our technology into existing systems, are proof of our commitment to providing the quality and productivity and technical support to your production environment. We will move ahead with you.

Our products are sold in all major international markets, with a commercial printing and packaging division for business forms and labels.

Engineering Solutions and Capabilities

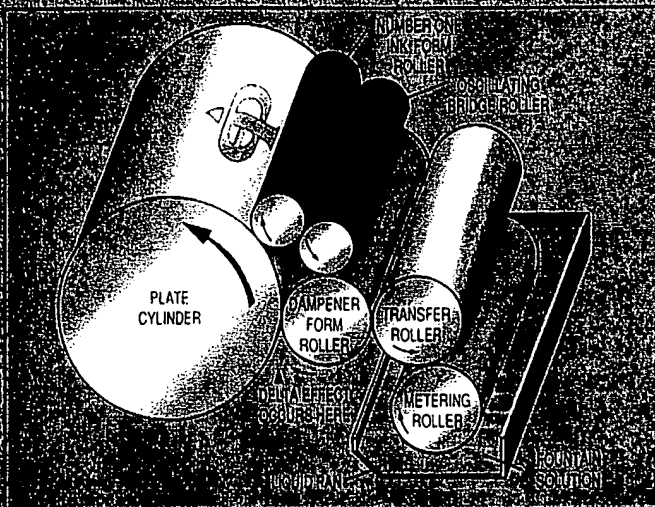
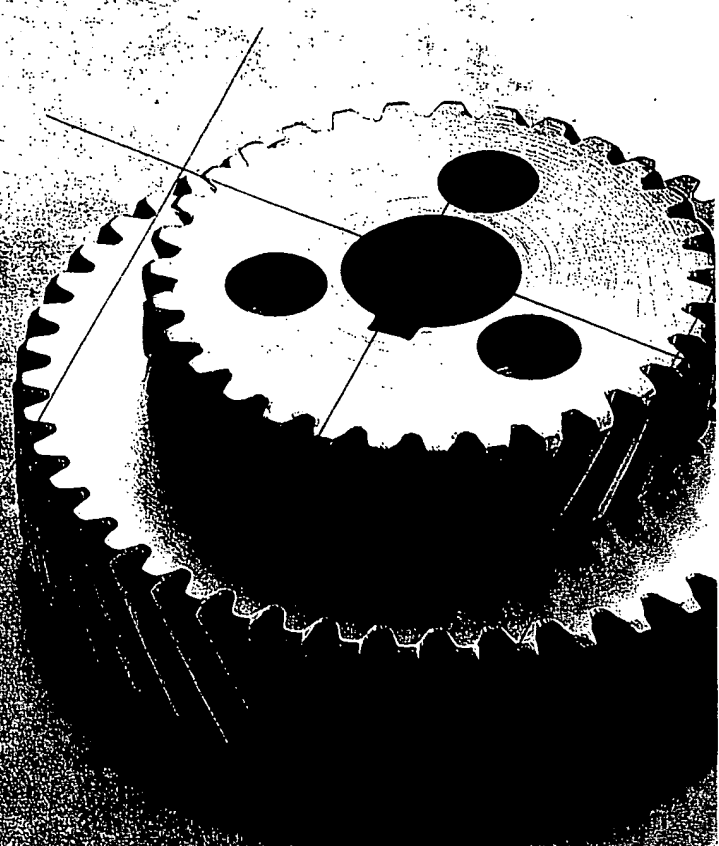
To best serve our customer's needs, we offer a wide range of engineering solutions, including design and development, engineering and manufacturing systems, and production and distribution. Our engineering and manufacturing capabilities are supported by our advanced tools (CAD, CAM, CAPP, and CAE). Our design and development capabilities are supported by our advanced tools (CAD, CAM, CAPP, and CAE). Our design and development capabilities are supported by our advanced tools (CAD, CAM, CAPP, and CAE).

W018949

The "Delta Effect"

Breakthrough Technology for Achieving Zero Defects

Delta's patented Delta technology is a revolutionary breakthrough in the prevention of hickies and other defects during the printing process. A valuable addition to any zero-defect program, the unique Delta design utilizes helical gears and positive roller settings to drive the dampening form roller at a slower surface speed than the plate cylinder. This differential motion, called the "Delta Effect," wipes away the foreign particles that cause hickies, while continually allowing a fresh charge of ink to the plate.



Eliminating Hickies Once and For All

The Delta design removes virtually all plate-related ink and moisture, resulting in a clean, dry plate. The Delta design also improves the quality of the Delta system, which means less money spent on plate and ink, and a more efficient printing process.

The Delta design also eliminates the need for hickie rollers, which are used to remove hickies from the plate. This means less waste and a more efficient printing process.

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The Delta Design

W018950

The Delta Print Quality System

Prints with superior detail and contrast
No ink, no heat, no noise, no fumes

Prints on a wide variety of media
No ink, no heat, no noise, no fumes

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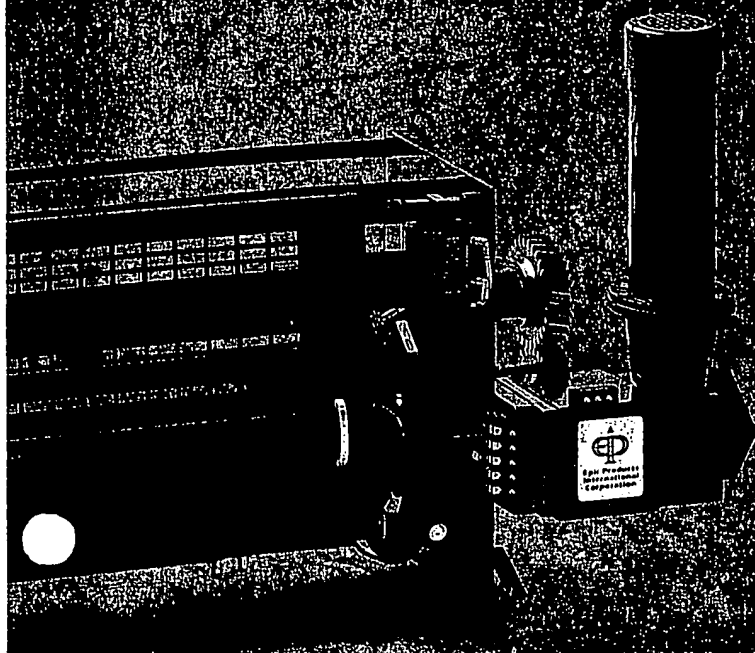
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W018951



Retrofitting the Delta System

Delta can retrofit the Delta Print Quality system to virtually any of sheetfed and web offset presses and configurations.

The system is frequently specified as a replacement for the press manufacturer's continuous dampener prior to delivery of a new press, or as a retrofit to both conventional and continuous dampening systems of older presses to extend their useful lives.

Delta has made Delta system retrofits to virtually every major model of every major press manufacturer. Call Delta for details.

Key Benefits of the Delta Print Quality System

- Hickey-free printing
- Improved print fidelity
- Denser, more consistent solids
- Sharper images and cleaner reverses
- Reduced ghosting
- Easy adjustment for faster make-readies
- Increased operator safety
- Instantaneous control of ink-water balance
- Lower ink usage, reduced downtime, and less waste
- Faster color response
- Maintains the design integrity of press ink train

W018952

Delta In-Line Coater/Dampener

The Delta In-Line Coater/Dampener applies a continuous, uniform, metered film of aqueous or U.V. coating directly to the plate cylinder. Positive roller settings ensure precise control of coating transfer. Coat weights can be varied by turning the potentiometer speed control.

Quick changeover to printing is handled easily. In this mode, the unit functions as Epic's well-known Delta Print Quality System, which combines continuous dampening with the patented differential "Delta Effect" to eliminate hickeys.

For overall coating, a standard offset plate can be used to transfer the coating via the offset blanket to the sheet. Spot coating can be achieved by mounting a relief plate on the plate cylinder. The spot coating image can then be precisely registered by plate cylinder movements, as easily as a printed image.

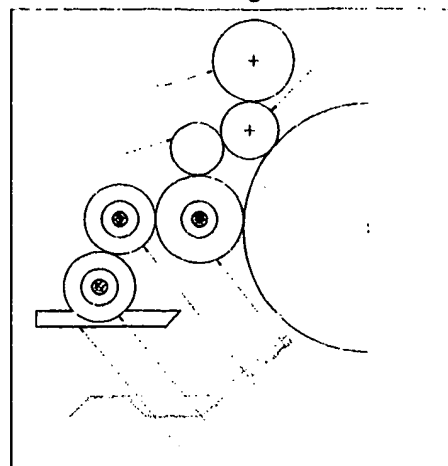
Specifications include:

- Resilient covered form and metering rollers
- Motor driven transfer and metering rolls
- Electronic interlink with all press sequences
- Gear driven form roller
- Solid state drive
- Pneumatic actuation
- Refrigerated circulators
- Positive displacement coating pump
- Pneumatically operated oscillating bridge roller

Epic Delta In-Line Coater/Dampeners are in use on virtually all types of sheetfed offset presses.

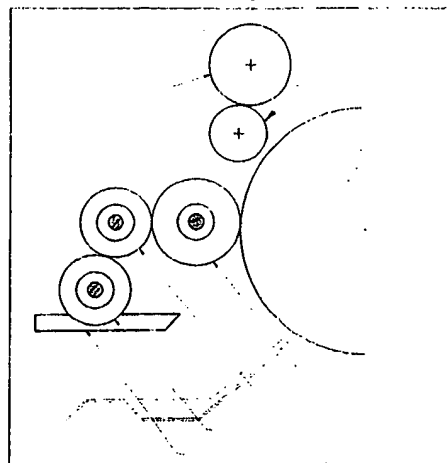
Call 1-817-640-3037

**Delta Coater Dampener
In Printing Mode**



View Looking Inside OS

**Delta Coater Dampener
In Coating Mode**



View Looking Inside OS

W018953



Epic Products International Corporation

2801 E. Randol Mill Road • Arlington, Texas 76011 • Phone (817) 640-3037 • Fax (817) 633-3085
Specifications are subject to change without notice.

Delta Coater/Dampener

Versatility: it's a key factor when you are considering in-line coating technology.

You require precision equipment that provides consistent quality.

You need to be able to change over to printing with ease.

You demand a proven yet cost-effective system . . . from a manufacturer with a reputation of quality performance. You can rely on Epic.

Guaranteed High Quality Performance — with Epic technology

Epic's Delta In-Line Coater/Dampener has a successful industry track record in the application of aqueous or U.V. coatings in-line, over wet ink. Superb, reliable performance is guaranteed. Coatings are laid with smooth, uniform consistency to provide flawless quality. The Delta In-Line Coater/Dampener is a unique, in-line, press dampening system that allows for easy changeovers between aqueous and U.V. coatings. It does not require the addition of a separate coating mechanism.

Benefits of the Delta In-Line Coater/Dampener include:

- Smoother finish and higher gloss than press varnish
- Superior scuff resistance
- Increased productivity due to the elimination of secondary operations
- Faster handling of jobs, since the coatings dry before reaching the delivery
- Elimination of labor coat in register
- Quick changeover from coating to no coating

All the benefits of the Delta Print Quality system are incorporated into the Delta In-Line Coater/Dampener. It provides a superior image with reduced ghosting.

W018954

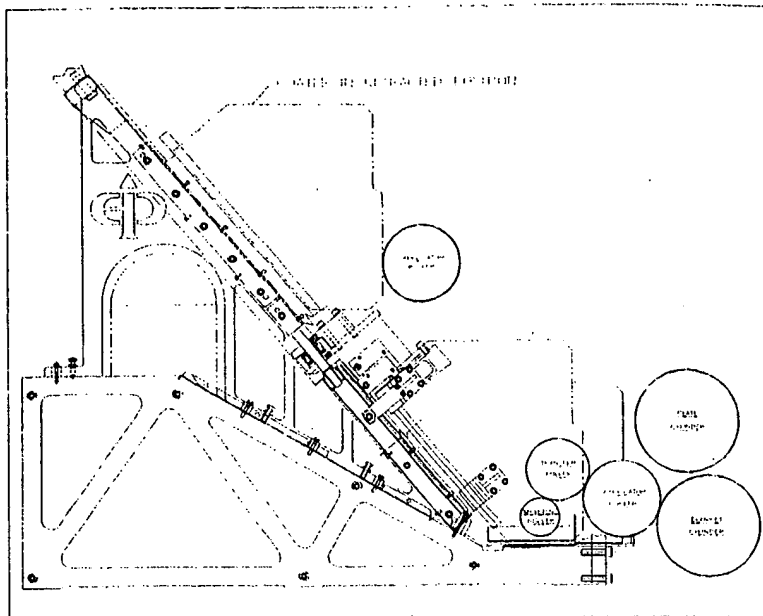


Blanket Coater

The Epic In-Line Blanket Coater applies a continuous, uniform, metered film of aqueous or U.V. coating directly to the blanket cylinder. This allows the coating to be transferred directly to the sheet in a smooth, uniform film, either spot or overall.

When used with a suitable curing system (also available from Epic), the coating dries before the sheet reaches the delivery, thereby allowing faster handling of jobs.

The proven three roll design does not require roll changes for various coating weights or varnishes. Partial or full retraction can be provided depending on accessibility requirements.



Specifications include:

- Three roll design allowing application of varying coat weights
- Independent variable speed drives
- Single panel control station for operation of all coating functions
- Stainless steel coating pan
- Positive displacement coating pump
- PLC Logic control for integration with press controls
- Brushless AC motors with inverter drives, designed to follow press speed

The Epic Retractable Blanket Coater can be installed on virtually any type of high pile sheetfed offset press.

Call 1-817-640-3037

W018955



Blanket Coater

In-line coating: it's the wave of the future. Applying coatings in-line, over wet ink, is a faster, more efficient way to enhance your products without the need for varnish or excessive spray powders.

Yet how can you be sure of maintaining quality when you make the transition from traditional varnishing to in-line coating? Can you depend on the newer technology to produce the results your customers expect? And what about flexibility? Epic has the answer.

Reliability, Flexibility and a Superior End Product with the Epic In-Line Blanket Coater

Epic's In-Line Blanket Coater applies coatings in-line with uniform precision, providing a level of quality that can be repeated with consistency. Engineered for reliability, the system is industry-proven in presses around the world. Plus, the proven three-roll design permits the flexibility to apply various coat weights without the need for roll changes.

The Epic In-Line Blanket Coater provides:

- Smoother finishes and higher glosses than that obtained with conventional varnishes
- Superior scuff resistance
- Increased productivity due to the elimination of secondary operations
- Faster make-readies
- Faster handling of jobs, since the coatings dry before reaching the delivery
- Quick changeover from coating to printing

W018956



Epic Corporation
(817) 633-3085

General Information

- Ink-Water balance achieved quickly with absolute dampener control.
- Special Delta Drive Systems.
 - Splined, thru hardened steel Delta drive shafts.
 - Case hardened, splined steel, helical gearing.
- Transfer and metering roller drive gears are case hardened helical gears.
- Pneumatically operated oscillating bridge roller.
 - The bridge roller can be made to oscillate or the bridge roller can be silent.
 - The bridge roller pneumatic system can be run integrated or non-integrated with the push of a button.
- Safety systems are standard.
 - Safety guards with switches that deactivate unit and press when the guard is raised.
 - Nip guards in the inturning nips where cleaning of rollers is required.
 - Safety liquid level systems that turn unit off if the liquid level drops below specified levels.
- The Delta System prints drier, reducing emulsification in the inker.

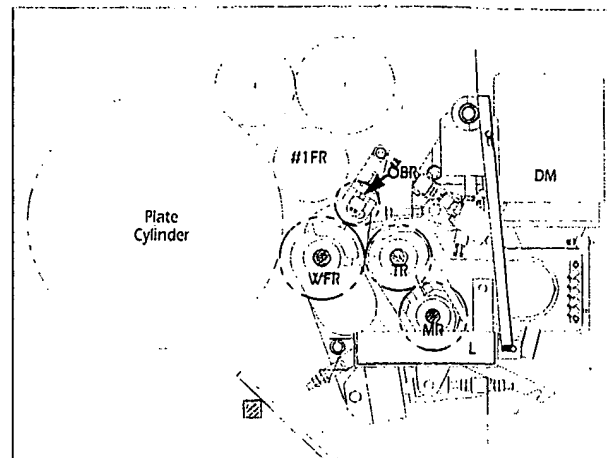
Information on Web Dampeners

All the general items listed above plus these additional items:

- The option of automatic lubrication system or integrating the dampener into the existing press automatic lubrication system.
- Mirror finished chrome rollers to minimize ink feed back.
- Each end of the oscillating bridge roller is covered with a rubber boot to keep contaminants out.
- Large capacity spherical roller bearings are designed into each unit.
- Brushless AC motors with inverter drives.
- PLC Logic allows for:
 - Plate pre-wet
 - Speed following with individually trimmed units
 - Auto impression
- Plate following: Allows the water form to cock with the plate without having to readjust rollers.
- The Delta System prints drier, reducing registration problems caused from paper stretch.
- Resilient rollers are covered with high temperature nitrile.

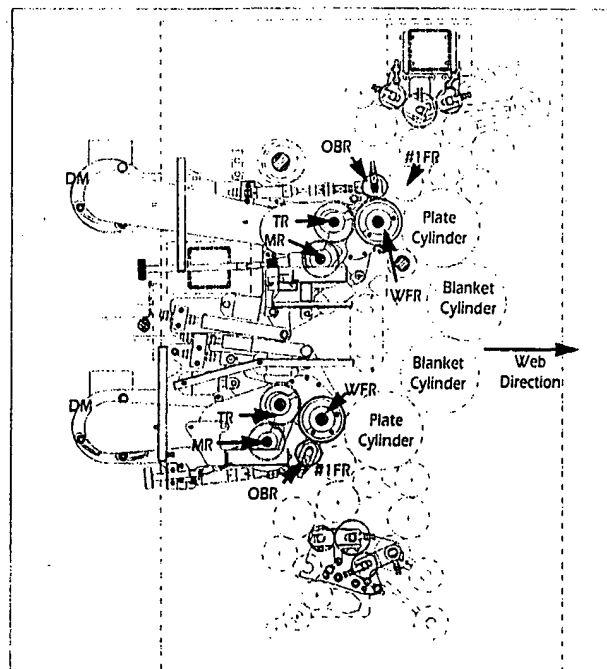
Epic can install the Delta Print Quality System as a standard on new presses or as a retrofit.

Call 1-817-640-3037



Commercial Sheetfed

#1FR: Number one ink form roller ▪ WFR: Water Form Roller ▪ TR: Transfer (Chrome) roller ▪ MR: Metering (Pan) Roller ▪ OBR: Oscillating Bridge Roller ▪ L: Liquid Pan ▪ DM: Drive Motor



Web Perfector

#1FR: Number one ink form roller ▪ WFR: Water Form Roller ▪ TR: Transfer (Chrome) roller ▪ MR: Metering (Pan) Roller ▪ OBR: Oscillating Bridge Roller ▪ L: Liquid Pan ▪ DM: Dampener Drive Motor

W018957



Commercial and Folding Carton Printing

Today's commercial and folding carton printers face greater challenges than ever before, from using recycled materials to meeting zero defects. Every brochure . . . every package . . . every printed carton must present a lasting impression of quality while winning environmental approvals. To address the varied, often conflicting demands of the day, these printers need highly creative solutions and tools.

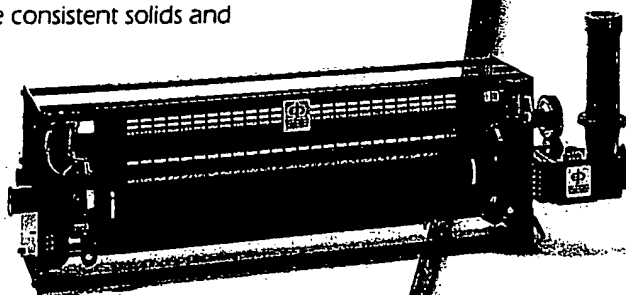
Epic can help you print superior materials while reducing press down time, minimizing waste, and saving hours of product inspection.

Giving You the Technology to Achieve Zero Defects with the Delta Print Quality System

Epic's Delta Print Quality System, featuring patented Delta technology, allows sheetfed and web printers to:

- Guarantee hickey-free printing — with no lost press time
- Reduce ghosting and streaking
- Print sharper images and cleaner reverses
- Gain precise control over ink-water balance — delivering denser, more consistent solids and truer colors
- Reduce waste by decreasing the stops and starts normally

associated with hickey removal



"Since our Delta installation, we've gained almost total elimination of blickeys on our six-color press, and our overall quality is better than ever. Customer service has improved, too, since our checks go smoothly. There's no question that the investment was worthwhile."

Mike Patton, President
Creative Graphics Inc.
Orange County, CA

"In the past, customers expected the best printing to have no imperfections. We were allowed to have a certain number of blickeys, but we still had to print overruns. It was necessary to visually inspect every sheet in the entire job and sort out the bad ones. Now that we're running Delta, we've eliminated the hickey problem altogether."

Rolf Peterson,
Marketing VP
Royal Paperbox
Montebello, CA

100%, No-Risk Money Back Guarantee

If Epic Delta doesn't remove at least 98% of all plate-caused hickies...we'll buy it back!

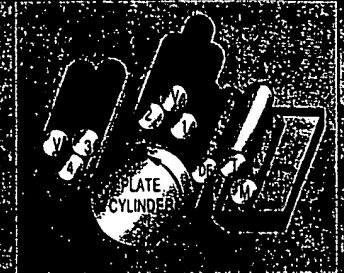
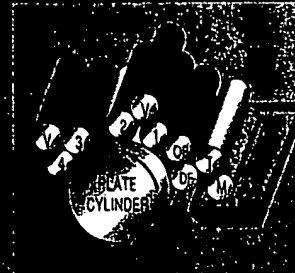
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Epic Products International Corporation

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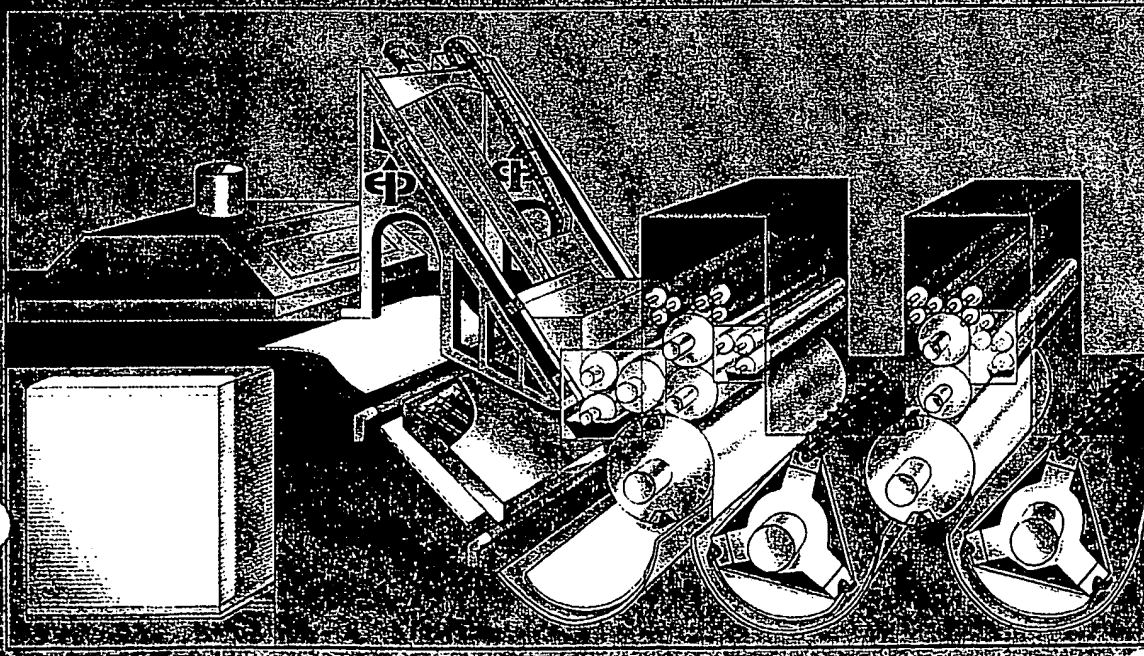
Coating Systems



Delta Print Quality Coater and Delta Coater/Dampener

Delta Roll Blanket Coater

The Delta Roll Blanket Coater is a versatile, compact, and efficient coating system. It is designed for the application of various coatings, including inks, varnishes, and specialty coatings. The system features a roll of blanket material that is coated and then used to transfer the coating to the substrate. This design allows for a wide range of applications, from high-speed production to small-scale, custom coating jobs. The Delta Roll Blanket Coater is available in both stationary and retractable versions.



From left to right, this diagram illustrates the Press/Delivery/Evacuation System, Infrared Convection Dryer with auxiliary Air Knives, Retractable Blanket Coater, Delta Coater/Dampener, and Delta Print Quality System. All equipment shown is manufactured by Epic Products.

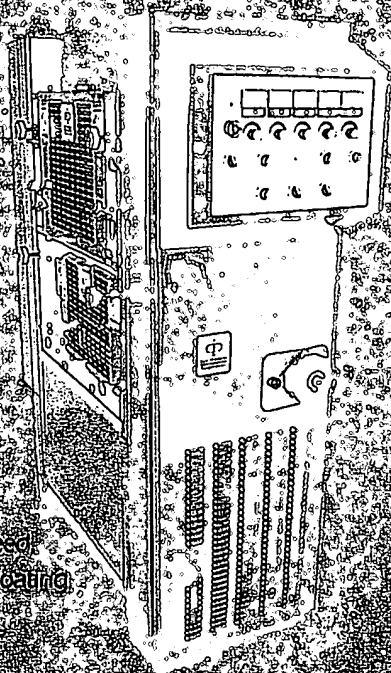
In-Line Web Coating

Adding Appearance Without Sacrificing Press Speed

Epic's In-Line Web Coater helps to enhance the value of any printed piece by adding attractive high gloss, rub resistance, oil or moisture resistance coatings in-line without limiting press speed.

Single or Double Side

In-Line Web Coater applies coating to either one side or both sides of the web without smearing or run-off. The system can apply a variety of coatings including water-based, solvent-based, catalytic or UV coatings on all types of paper. Regardless of press speed, coating is free of pinholes or streaks. Full or pattern coating systems are available.



The Finishing Touch

IR, UV and Convection Dryers

Epic designs and manufactures custom drying and curing systems for all types of sheeted presses. Contact us for details.

From hickey-free printing with the Delta Print Quality System through coating and drying systems on the most basic single color presses to the most complete multi-color presses encompassing commercial sheeted and web folding, carbon forms and metal decorating... Epic offers the technology and expertise you need to produce the highest quality printed products.



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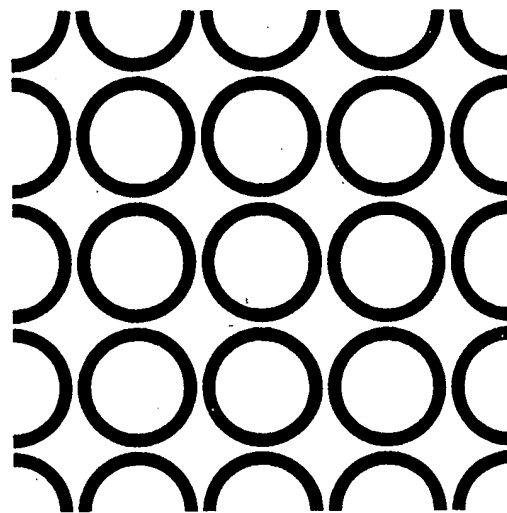
Lasting Support

After every installation, Epic offers continuing support. Updating configurations to changing needs, keeping customers current on new accessories, performing repairs, providing modifications, and training are all part of the Epic package. From helping our customers create lasting impressions to providing lasting service, we are dedicated to keeping our customers' press lines operating at productive, high quality levels.

Printed in the U.S.A. on a 6-color 40" press equipped with the Delta Print Quality System.

Specifications are subject to change without notice.

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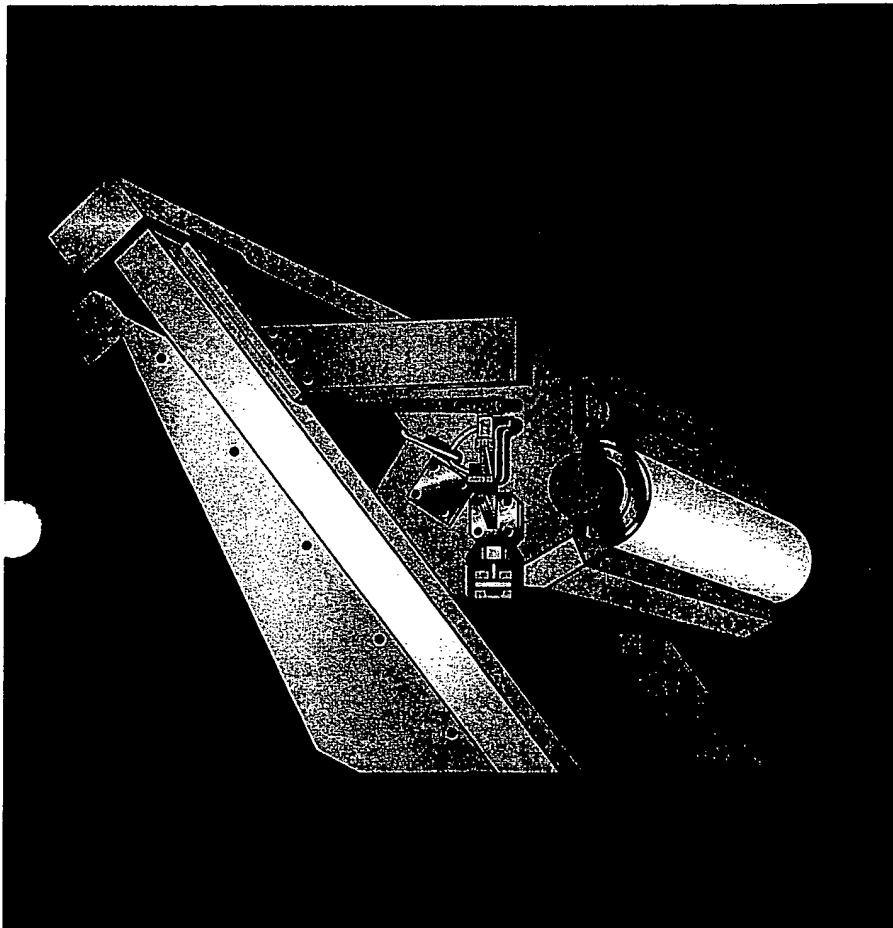


SUPER BLUE™

**PBC PLATE/BLANKET
AND PC PLATE COATER**

**BECAUSE TO MOST
CUSTOMERS HIGH
GLOSS MEANS
HIGH QUALITY**

It is now possible to dramatically increase gloss levels of printed sheets



High-impact quality at low cost

Among print buyers and consumers alike, "gloss" and "feel" are strongly associated with quality. Through our systems, printers can profitably achieve superb finish-quality and high-impact appearance at low cost.

Our Plate/Blanket Coater (PBC) maximizes your coating flexibility, giving you more precise control and broader capabilities than ever before. Offering full-coverage gloss or matte coatings as well as spot coatings of impeccable register and quality, the PBC smoothly and consistently applies uniform coatings of a wide viscosity range to any desired thickness.

- Precision spot-register applications
- Elimination of halos and hard/beaded edges
- Maximum coating application

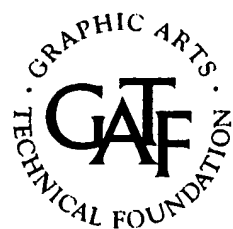
The advent of coatable, water-based and UV-curable resins offers sheetfed color printers the unprecedented power to add high gloss levels, special effects and unusual surface treatments to their range of *in-house* capabilities. These coatings vastly exceed the gloss potential of varnish, while banishing forever the mess and quality problems spray powder causes in the pressroom.

Maximize press utilization while minimizing clean-up

Because the PBC is easily retracted when coating is not necessary, the press unit used for coating can function as a full printing unit whenever you need it. Or, you can easily establish a dedicated coating line on an under-used press. What's more, with our coaters, you will eliminate forever the press downtime associated with blanket cutting, packing and image registration. No other coater can accomplish this.

Our coaters minimize wash-up and makeready, offering unrivaled time and cost savings. Ruggedly constructed, easy to operate and maintain, our patented coaters are on the leading edge of industry technology.

Winner



InterTech Award

W018964

- Makeready as fast as regular ink presses
- Elimination of slinging and misting problems
- Minimized wash-up times

Improved quality means customer satisfaction

The PBC provides unparalleled quality control, enabling you to coat with as much control as you print. Coating material is applied as if it were another ink color, using your printing unit as it was designed to operate — to lay down a precise film membrane on the substrate.

What's more, the PBC achieves this high-impact appearance in a fraction of the time it takes to varnish or laminate — and without the mess and quality control problems associated with these now obsolete methods. So your customers receive the highest quality product, with an incredibly fast turnaround.

Super Blue Plate/Blanket Coater

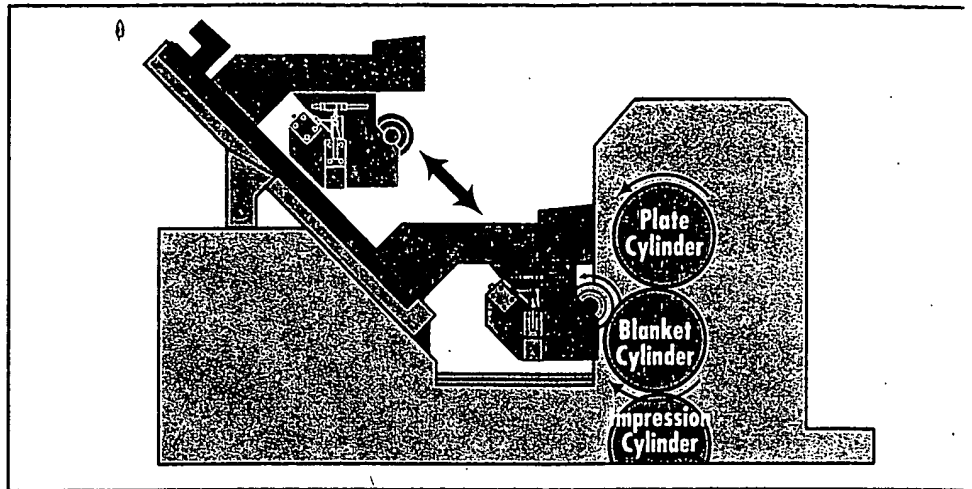
The PBC applies coating either at the blanket, for full coverage work, or at the plate, for precise register application of spot coating without hard edges. Or when coating is not necessary, it can be easily retracted to allow for regular printing uses. Unlike other coater designs that haphazardly squeeze coating material onto substrate under pressure — slinging coating material — the shear-coating PBC works neatly and precisely.

In the blanket mode when overall coverage is required, PBC's design provides for fast makeready and smooth application of the coating.

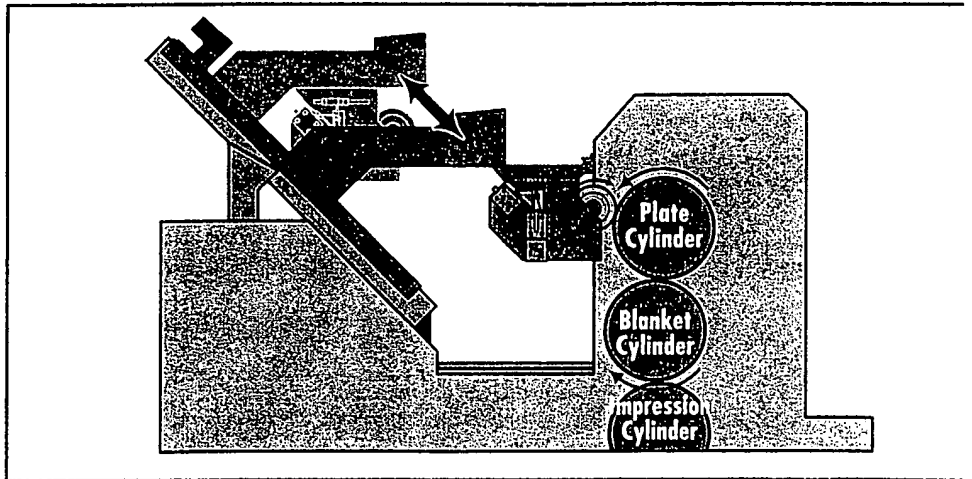
In the plate mode, the coater applies coating to a relief image on the plate cylinder to apply a uniform thickness of the coating film to the blanket cylinder. This coating "image" is then transferred by the blanket to the substrate, ensuring precise registration in all axes. Coating thickness and pressure between the plate, blanket and impression cylinders are all accurately and easily controlled.

Both the PBC and its Common Impression Cylinder (CIC) press counterpart, the Plate Coater (PC), improve operational profitability by eliminating the extensive "wash-up" downtime associated with coater dampeners — the only alternative with a CIC press. The typical two to three hour wash-up is reduced to less than a half hour, and the entire process is carried out independently from the press.

Being fully retractable, the coater does not interfere with the dampening system, ensuring fast changeover from print to coat and coat to print. This makes your entire operation more efficient *and* more profitable.



PBC in Blanket Position

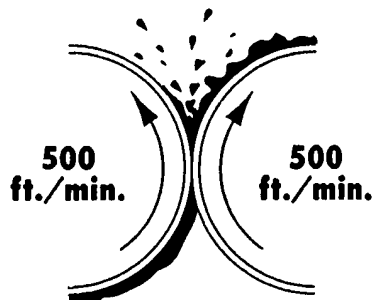


PBC in Plate Position

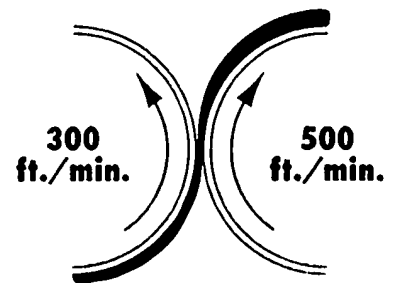
Productivity, safety and long-term value

As a supplier of precision-engineered coating and drying systems for the graphic arts and packaging industries, Printing Research, Inc.'s high-performance systems improve your bottom-line profitability by adding value to your existing operations. With our systems, you improve the quality of your services by becoming a low-cost provider of the highest quality printing — all while maximizing the utilization of your existing presses. Our dependable, high-performance systems will increase your sales, profits and customer satisfaction levels.

See the difference yourself. Experience a demonstration of our PBC and PC and witness how coatings can be as easy to handle and precise to apply as the ink used in daily printing!



NIP Application



SHEAR Application

Instant-drying inks and the elimination of spray powder have been the dream of every printer and printing buyer. The idea was put forward in the 1970's and 80's that it would be possible to print with conventional inks and apply a coating which would dry completely before placement on the delivery stack. This would place a dry skin over the ink, eliminating offsetting, sheet marking and the need for spray powder. The inks dry under the coating.

The advent of the 90's has made the dream a reality. It is now possible to print superior quality with conventional inks and coat the surface in order to deliver a dry, mark-free sheet at full production speeds. This is what the Super Blue products from Printing Research accomplish for you.



Printing Research, Inc.

10954 Shady Trail Dallas, Texas 75220 U.S.A.

Telephone 214-353-9000

Telex 794028 Superblue dal

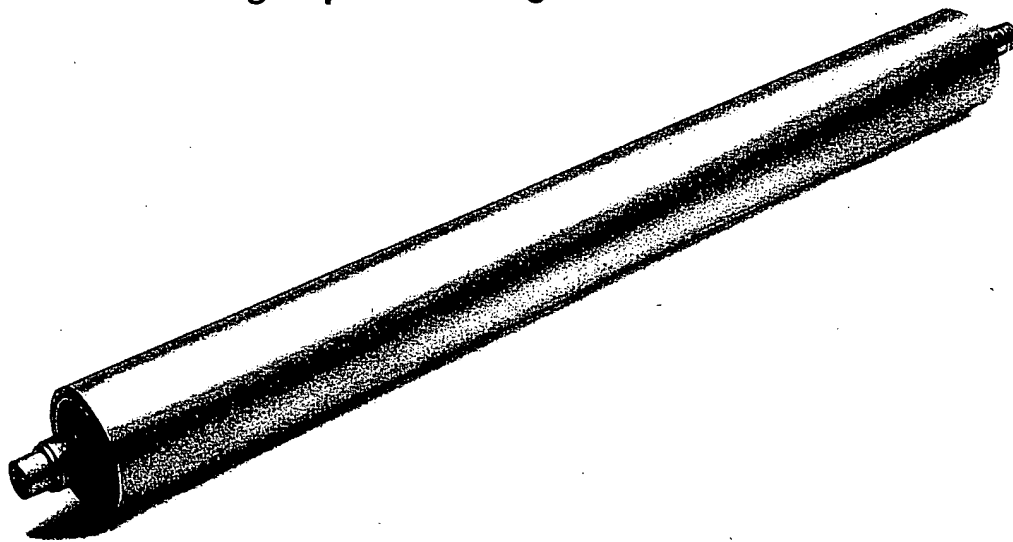
Fax 214-357-5847

Patented

W018966

**In coaters, one roll
is three times better
than three rolls.**

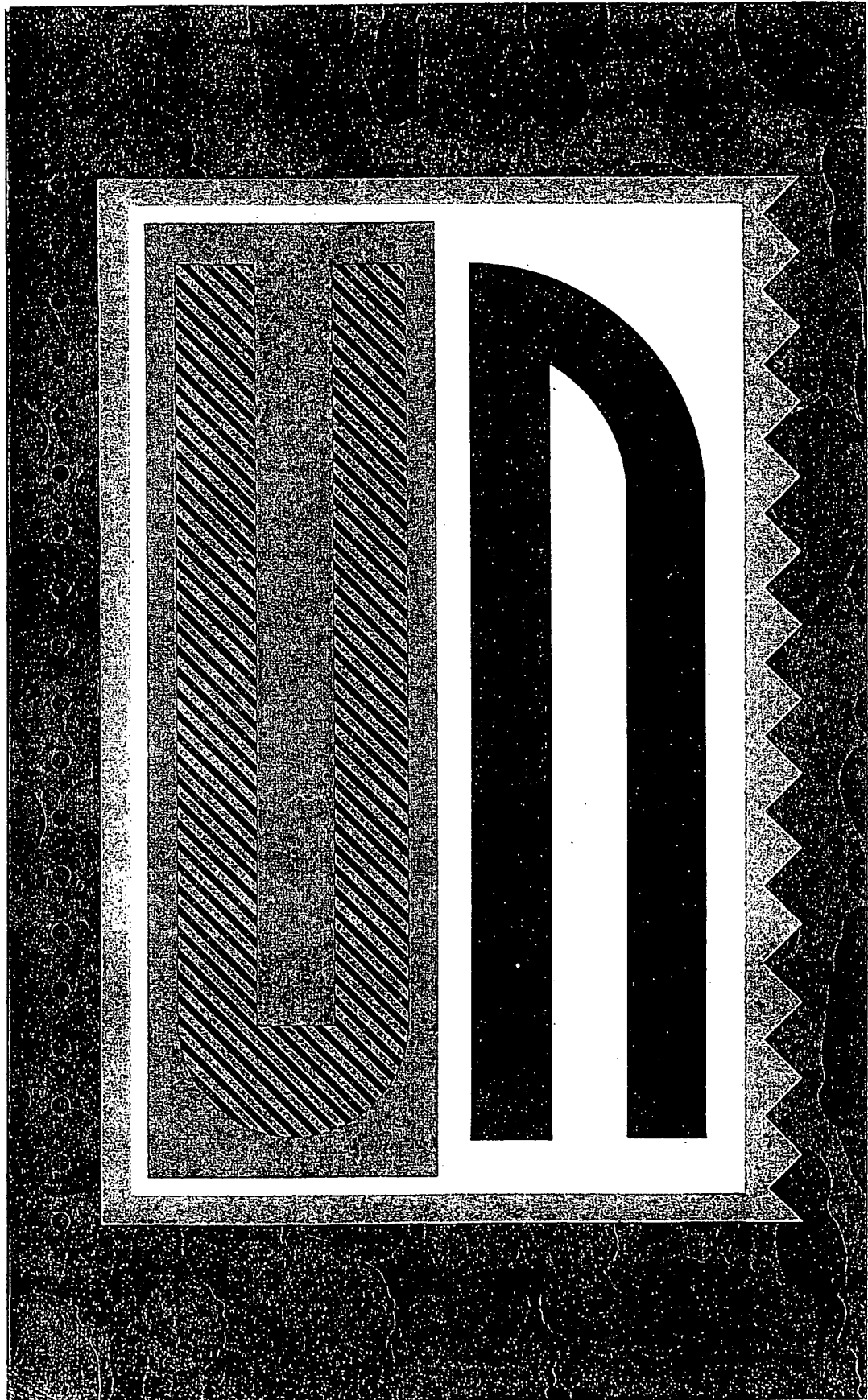
Dahlgren proves once again that less is more.



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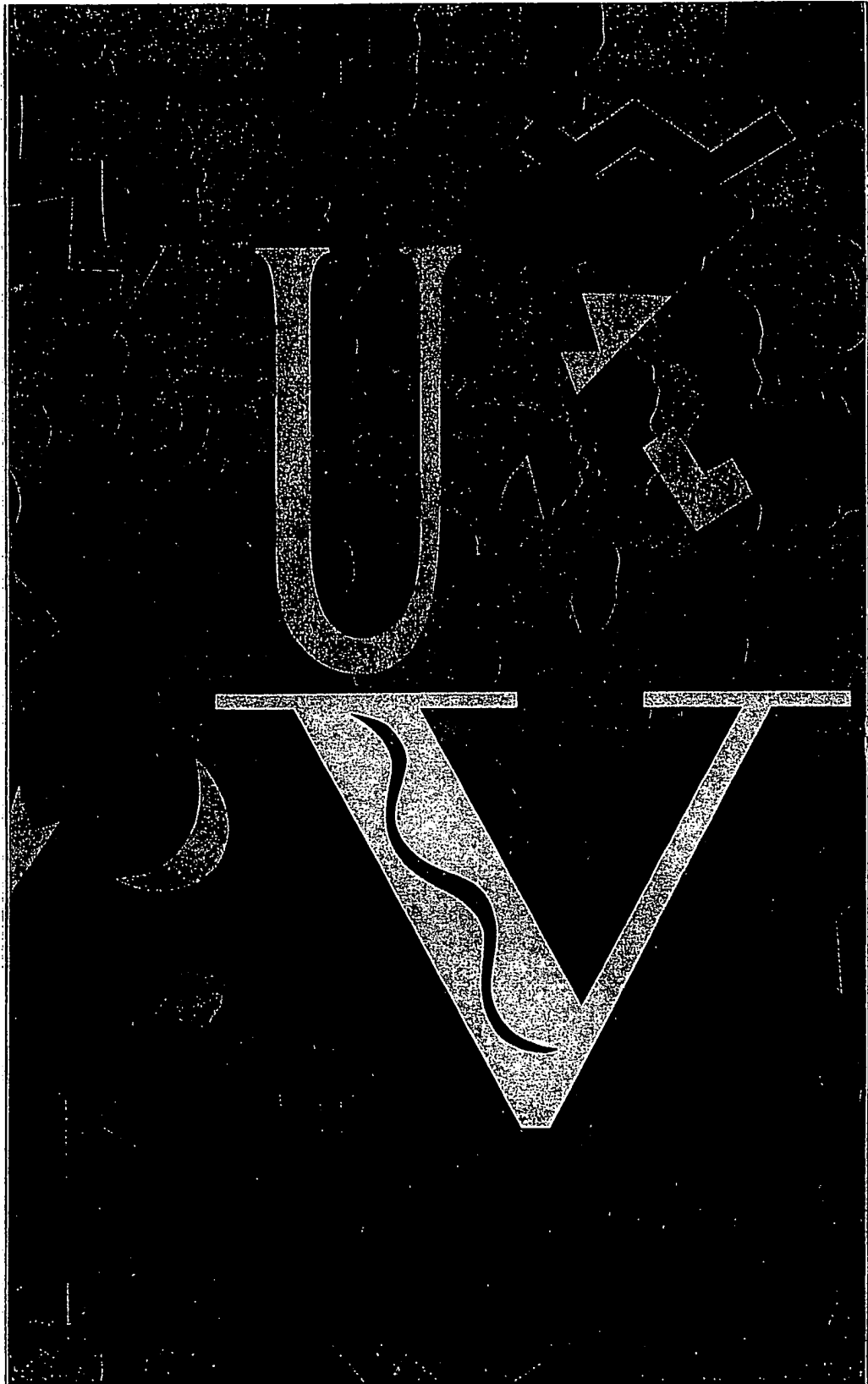
09345796-052501

With Dahlgren's patented single-roll coater, achieving outstanding results is simpler than ever. Unlike multiple-roll coaters, the Dahlgren coater positively locks to the press to eliminate ridging, streaking, slinging and excessive orange peeling. It sets up in 5 minutes and cleans up in 10! And unlike other coaters, the Dahlgren system provides a uniform high quality coat, from start to finish. Coatweights can be adjusted at will.

Our single-roll coater provides relentless consistency for U.V., water based and specialty coatings on all popular sheet-fed presses up to 78" wide. And like all Dahlgren products, your Dahlgren coater is guaranteed to your specifications or your money back.

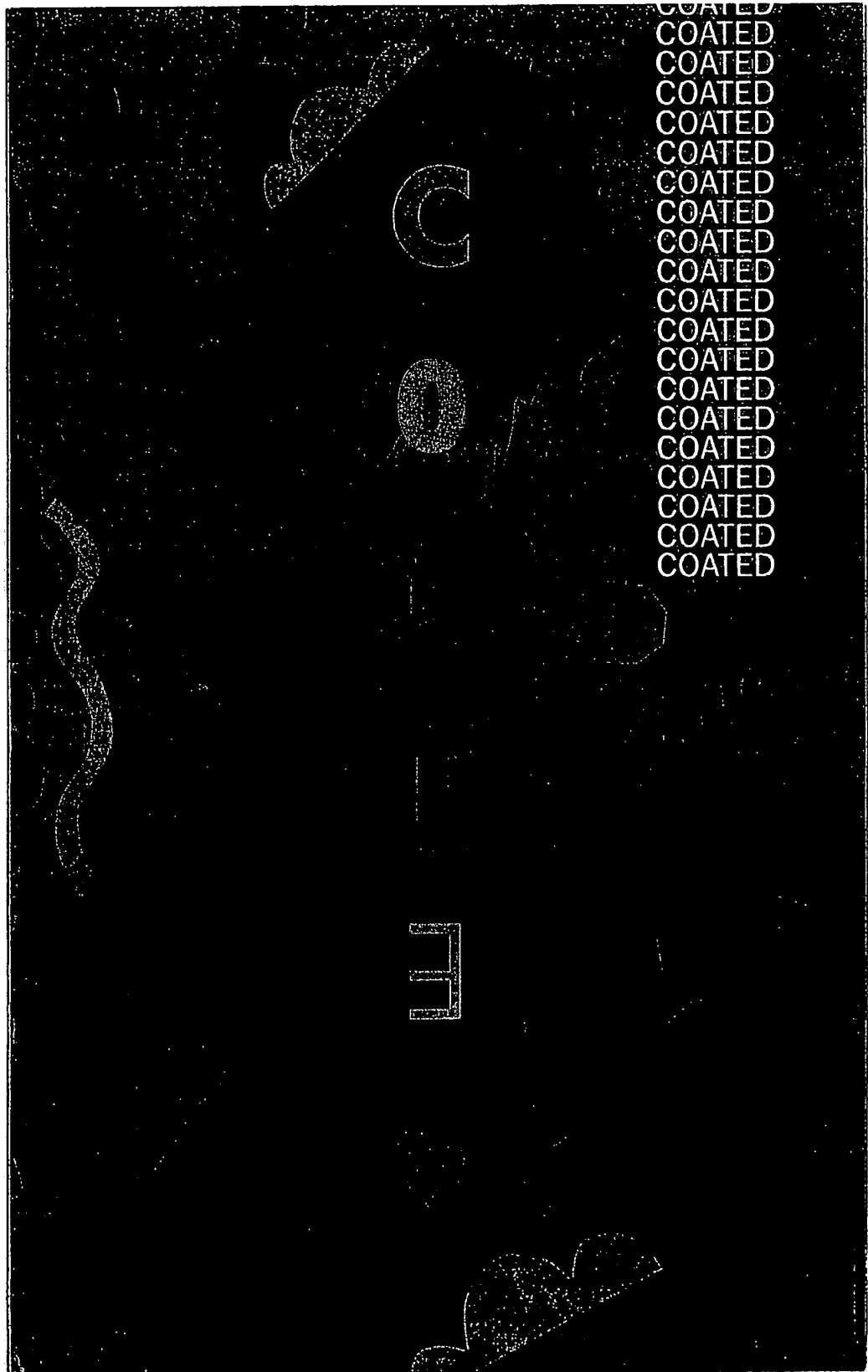
So call us toll-free at 1-800-527-5301 for more information today. And see how less is more with a Dahlgren.

09345796 .052501



W018971

09315796.052501



1052490-95/STC60

*Ask about our new coater for
Heidelberg Speedmasters® It lets you
simultaneously coat and print on a
single printing station!*

P.O. Box 115140, Carrollton, TX 75011
(214) 245-0035

One roll outshines them all.

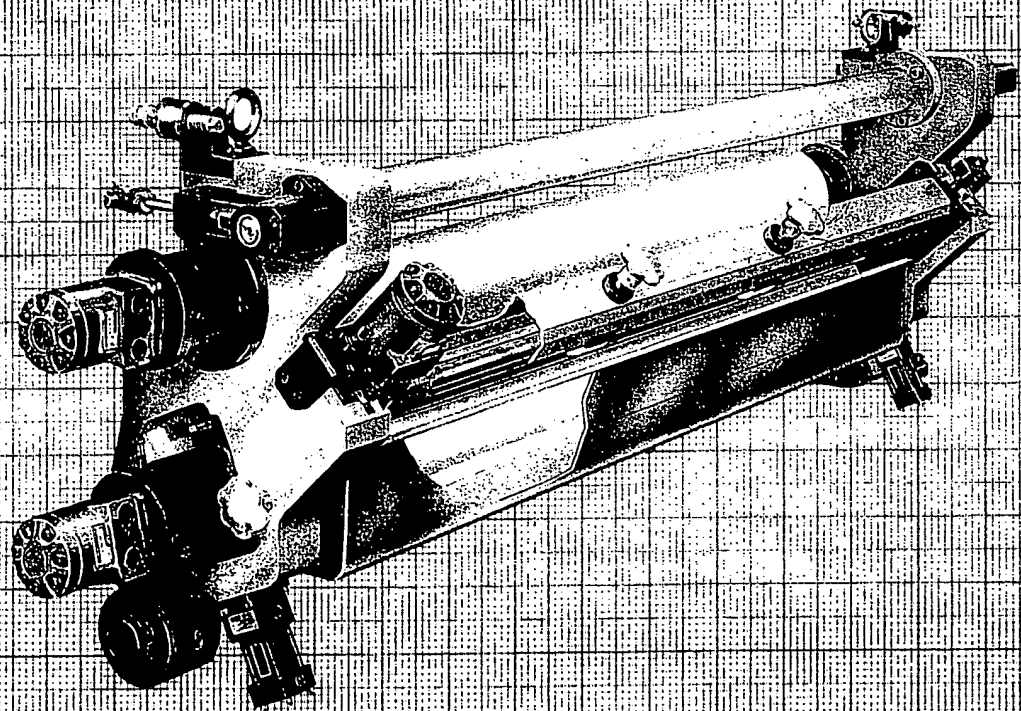
DAHLGREN[®]

W018973

BLANKET COATER

For application of aqueous or coatings direct
to the blanket cylinder.

IM
COLORDRY
TECHNOLOGY FOR PRINTING **INC**



09345796-032501

Patent for registration pending

© 1987 IMC, Inc.

W018975

Ruggedly constructed, simple to install and operate, the IVT COLORDRY Coater saves time and money, and assures smooth, uniform application of coatings of wide viscosity range and various thicknesses. The three-roll system, an in-line retrofit bolted to the last printing unit, permits application of coatings to printed sheets in line. When coating is not required, the IVT COLORDRY Coater is easily retracted on its pillow-block type mounts, and the printing resumes its normal printing mode.

The IVT COLORDRY Blanket Coater.

Applies water-based, ultra-violet or other suitable coating materials directly to the blanket cylinder of a sheet-fed offset press.

The IVT COLORDRY Blanket Coater can be used for either overall or spot coatings, and with a suitable drying system will eliminate the need for spray powder or press varnish. Press clean-up time is reduced, since only the blanket cylinder is used in the coating operation.

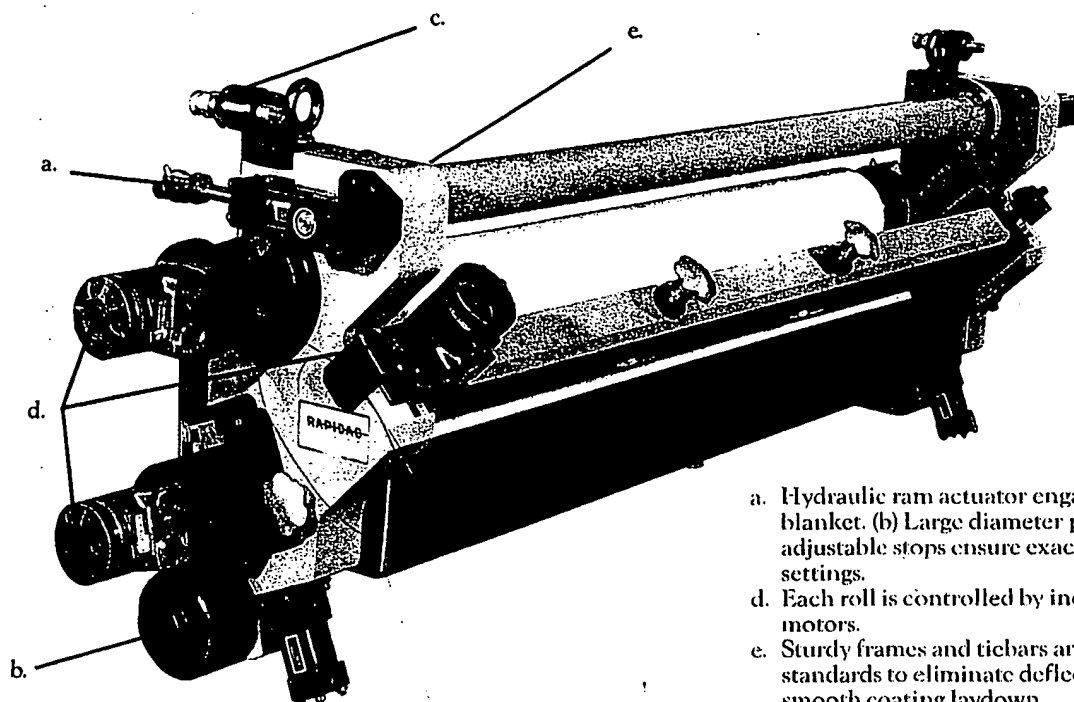
Coating thicknesses are easily varied, from a thin protective film to a thick laminate finish, by adjusting the speed and pressure of the individually-controlled, hydraulically-driven rolls.

Save time, increase productivity and lower costs.

- Fits almost all presses. The IVT COLORDRY Blanket Coater can be installed on a variety of sheet-fed presses. If desired it can be installed on a coating station, rather than attached to a printing unit.
- Fast installation. Simple, bolt-on retrofit; installation time normally two days of press down-time.
- Individual R.P.M. Indicators. For easy set-up and control.
- No interference with press run. Coater can be quickly and easily retracted or removed from press when not in use.
- Direct to blanket cylinder. Coating is applied from the applicator roll directly onto the press blanket cylinder.
- Variable thicknesses. Coating thickness can be adjusted during a run by varying coater roll speeds.
- Even laydown. Application direct to the blanket eliminates one split, provides greater control.
- No roll changes. Metering of coating is simple and effective over a wide range of applied thicknesses. No need for roll changes.
- Compact. The IVT COLORDRY Blanket Coater is designed to occupy the least possible space on the press.
- Rugged. Sturdily constructed to give dependable, lasting service.
- Reduced clean-up time. After coating, only the blanket cylinder requires cleaning. The ink train, dampening system and plate cylinder remain clean and ready for use.



Control panel operates both the coater and the hydraulic power unit. Digital meters continuously show RPM readings for each of the three rolls.



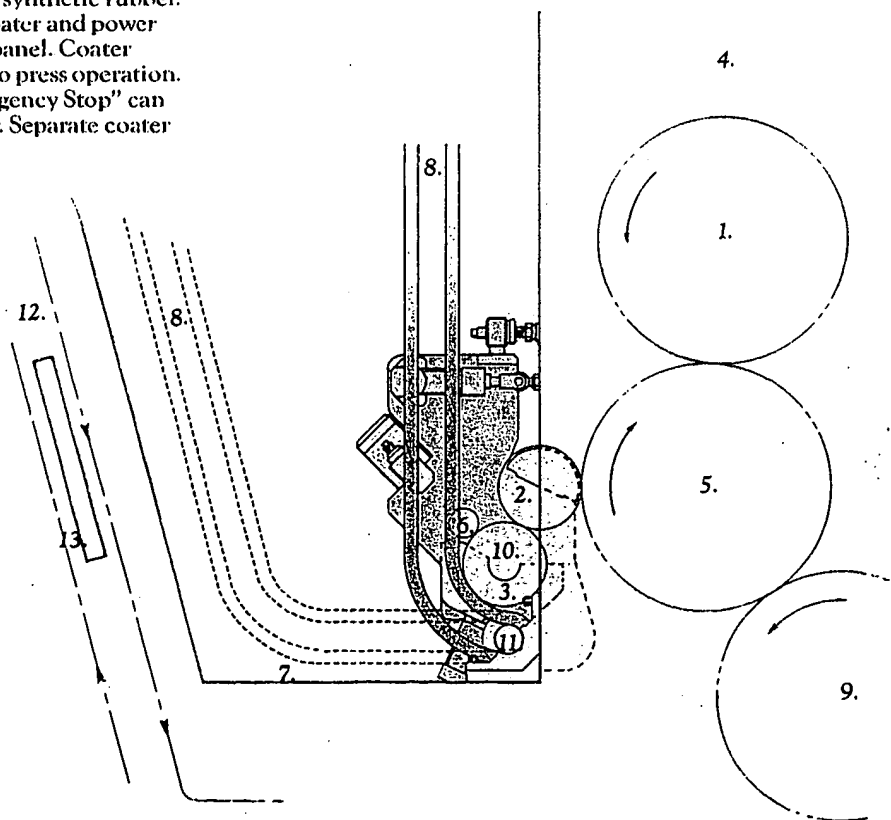
- a. Hydraulic ram actuator engages coater with blanket. (b) Large diameter pillow blocks and (c) adjustable stops ensure exact repeatability of settings.
- d. Each roll is controlled by individual hydraulic motors.
- e. Sturdy frames and tiebars are engineered to press standards to eliminate deflection and ensure smooth coating laydown.

Specifications

- Three roll design — Metering roll is chrome. Applicator and pick up rolls are synthetic rubber.
- Single Control Panel — Both coater and power unit are controlled from single panel. Coater operation is electrically linked to press operation.
- Emergency Stop — Press "Emergency Stop" can be interlocked to include coater. Separate coater "Stop" control is provided.

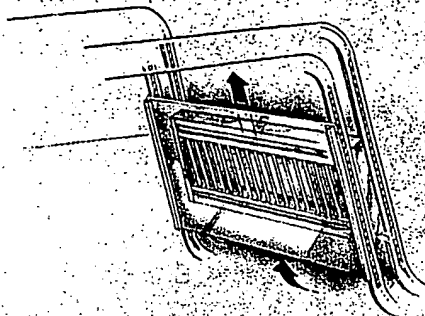
The Blanket Coater is retractable, and does not interfere with the dampening system, with fast changeover from print to coat and coat to print. The applicator metering and pick up rolls are independently driven through a hydraulic system, with the applicator being able to be run in reverse. Slinging, misting, striations, gear markings, and consequent loss of gloss, are largely eliminated. Greater flexibility in coating weights and optimum lay flat properties are achieved.

1. Plate Cylinder
2. Applicator roll
3. Coating pan
4. Last press unit
5. Blanket cylinder
6. Metering roll
7. Rear deck
- Retraction systems
- Impression cylinder
10. Pic-up roll
11. Pillow block mounts
12. Press delivery
13. Dryer to suit aqueous or UV coatings



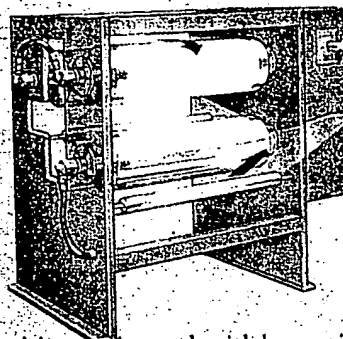
Other IVT COLORDRY products:

WATER COOLED IR DRYING SYSTEMS



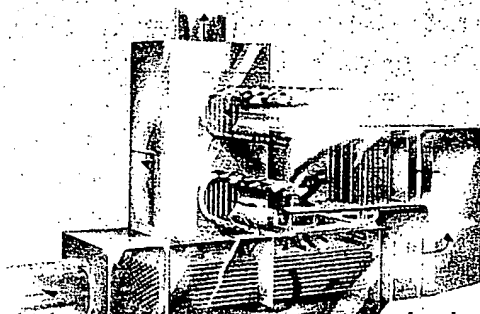
For accelerating ink drying reducing spray and over-drying of aqueous coatings.

CHILL ROLL STAND



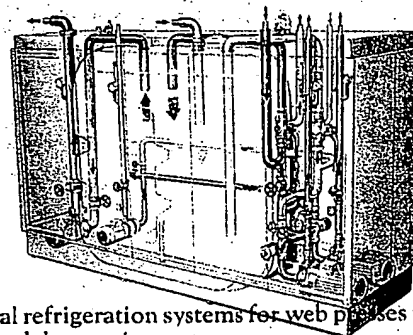
Compact, precision engineered, with low maintenance.

CATALYTIC PURIFIER



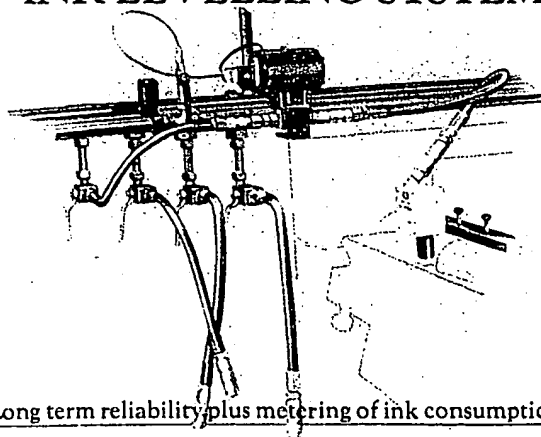
The highest standard of air purification plus the economy of heat reclamation.

PROCESS COOLING EQUIPMENT



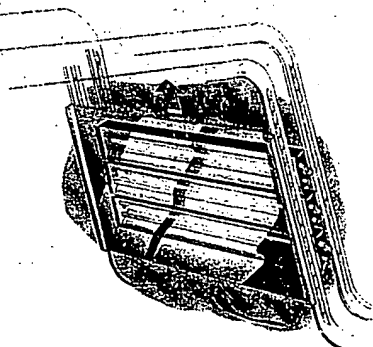
Central refrigeration systems for web presses inking, chill and dampening systems.

INK LEVELLING SYSTEM



Long term reliability plus metering of ink consumption.

'COLD' UV SYSTEMS

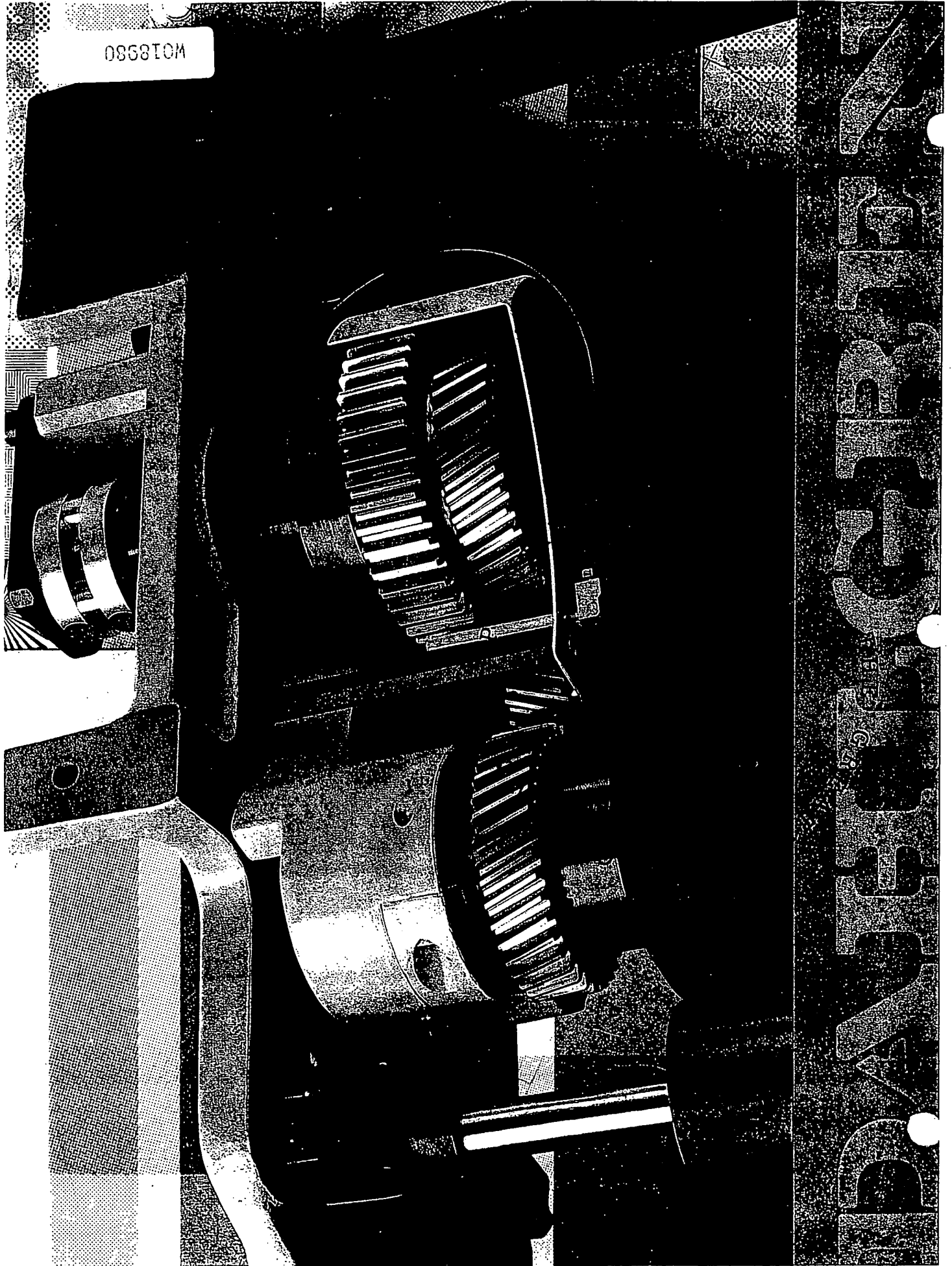


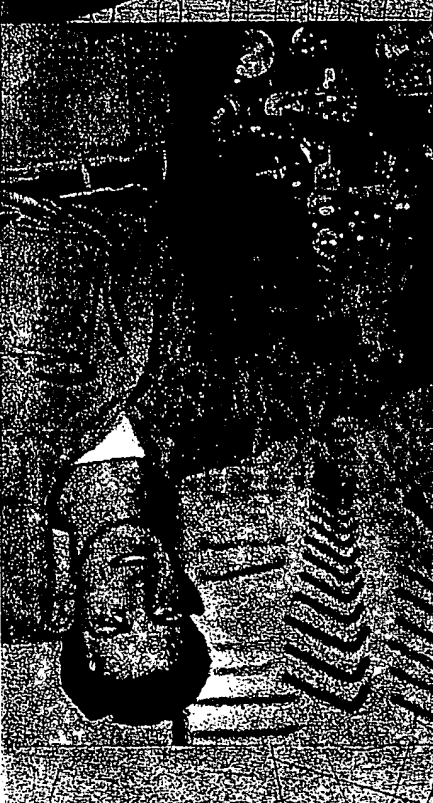
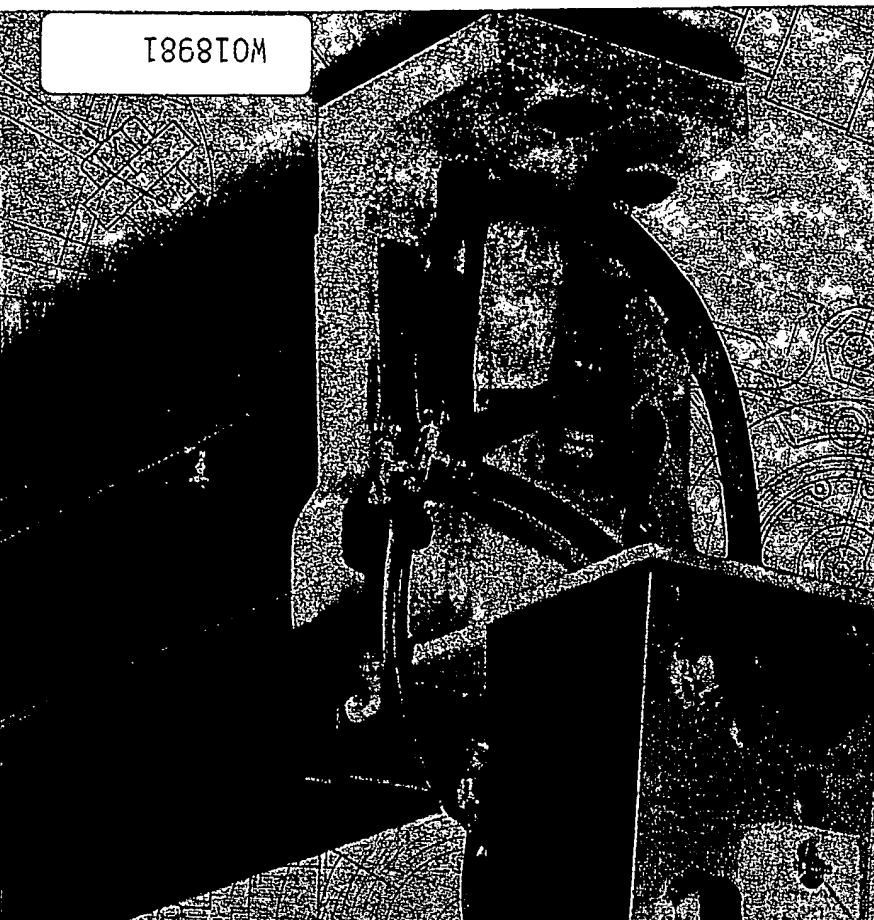
For the curing of UV inks and coatings on any substrate.

IVT
COLORDRY
TECHNOLOGY FOR PRINTING **INC**

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THE ROLLS OF THE PRINTING INDUSTRY

No doubt, the printing industry would still be alive had Harold Dahlgren never arrived on the scene. Yet, he did not because of his creativity and leadership in the printing industry will never be the same.

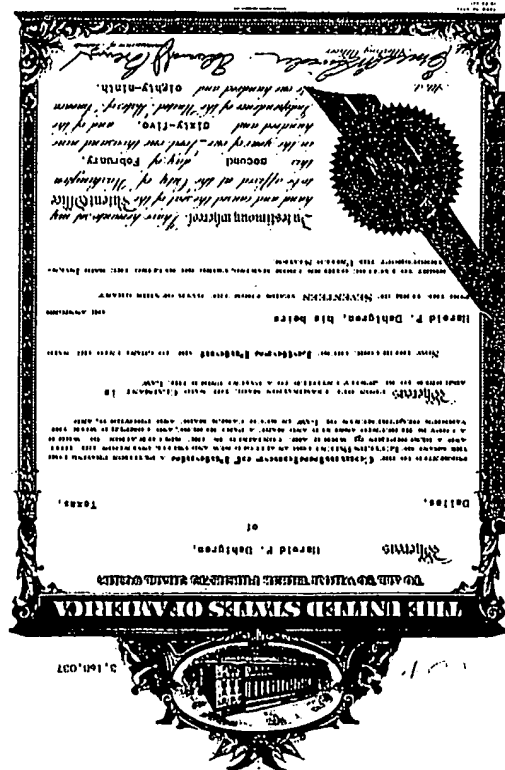
Johann Gutenberg

invented the first mechanical printing press in 1439. More than 550 years later, Dahlgren is still finding ways to improve on the concept.

In 1485, Ratdolt pioneered the use of color printing using a basic stencil technique. Using Dahlgren's dampers, today's printers achieve stronger colors than ever before.

Harold Dahlgren invented the first continuous duty dampening system for offset presses, launching a new age of productivity and efficiency for printers everywhere. He was the first to put a coater on a press. He developed the skewed roller system, permanently revolutionizing the lithographic process. To this day, Dahlgren has more dampers and coaters in operation than any other company worldwide. And the ideas are still rolling. Because today, as it has since 1969, The Dahlgren Company is truly thinkers—men and women whose commitment to the industry is to lead through innovation—professionals who dare to explore new directions. What result in solutions you can use to better run your printing operations. Whatever measure equally you apply. What on speed of coating and dampening for the printing industry. Dahlgren leads the way.

In more than 180 cases, Dahlgren has broken through conventional thinking to develop unique and novel printing concepts recognized by patent offices worldwide. This track record of innovation carries on today, as talented personnel interpret customer input into the technological breakthroughs that will drive the printing industry for years to come.



Hal Dahlgren

"Fighting the conventional dampening system for seven hours can make you hostile. I know. I used to be a pressman. But I was fighting more than I was printing, and I wasn't efficient. That's what gave me the itch to come up with a better dampening system."

- DaCapri develops and patents the art of chaperons multi-color woodcuts in 1516.
- Today, the Dahlgren name appears on more than 180 patents issued for casters and dampeners worldwide.
- The first censorship of printed books in 1501. Today's free press enjoys unparalleled options in a variety of products offered by the Dahlgren Company.

A new, light, graceful style of illustration emerges from Callot's copperplate tests in 1630. Over the years, rollers have resulted from Dahlgren testing.

DAHLGREN DAMPERS MAKE EVERY SHEET COUNT

The Dahlgren 3-Roll Damper represents the industry's first continuous-duty damper. It's the least expensive of our line, yet it adjusts with all the ease and performs with all the durability, simplicity and quality you can expect whenever you run with a Dahlgren.

Designed for sheet fed and web presses, the Dahlgren damper is the most productive single most productive equipment investment available for your pressroom. It's the most efficient, reliable, low cost of new rollers that will give you the best return on your investment. Quality, reduced downtime, fewer waste and more production — all while maintaining increased overall output. Existing equipment or you're expanding capacity. The Dahlgren damper provides continuous, consistent, responsive, high speed, 100% sheet yield, full overprint, sharp, driving, wide if needed. A low cost, precise, clean, clean, ever better.

With nearly 2,000 proven designs on the line, Dahlgren can help you solve any problem you face. We can provide a complete system, wide range of rollers, and more. Dahlgren's damper is designed to meet your needs, from moderate design to quality, manufacturing and cost of roller design. Dahlgren damper is made to enhance your printing performance.

W018983

DAHLGREN COATERS ADD PROFITS TO YOUR PRESS

Three-color process printing, with half-tone cuts, is invented by Kurtz and lies in 1892. Dahlgren-equipped presses make the entire printing process more profitable and professional.

Robert Barclay, in 1875, conceives the lithographic process known as offset printing. Dahlgren supplies a full scope of coaters and dampers for today's most popular web and sheetfed offset presses.

The "fly" and other principles for automatic press are invented by I. Adams of Rochester in 1834. In 1959, Harold Dahlgren established the principles that still drive Dahlgren today.

Getting the most out of your press is what Dahlgren coating systems are all about. They let you charge for the "W" water-based and specialty coating jobs you or your customers might send elsewhere. They are the most overall spot pattern coating plus they install easily and inexpensively.

Engineered to start up and clean up in minutes, Dahlgren coating systems are easy to use and maintain. They're compact, built to last and available in a wide variety of configurations for both web and sheet-fed presses. What's more, they incorporate a patented drying system, which helps you reduce the mess and expense of spray powder while you cut them around time and lower production overhead. If you want to improve your competitive edge and offer your customers the high gloss and protective benefits only coating can provide, specify Dahlgren.

The Dahlgren Blanket Coater features single roll simplicity for on-the-run adjustment and uniform coverage overall. It's the easiest coater on the market to maintain and operate. It sets up in 5 minutes, cleans up in 10. And like all Dahlgren products, it can be customized for your unique application, while giving you the highest amount of coating laydown of any blanket coater. What's more, this patented coater eliminates ridging, slinging and greatly minimizes orange peeling.

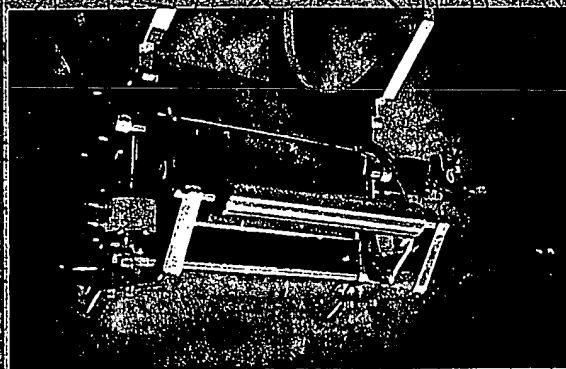
The Dahlgren LithoPlus™ Coater is designed for some of the most popular presses. It allows you to print and coat in a single pass, without sacrificing a printing unit. Plus, because it can be retracted out of the way, regular print jobs can be run easily. With the revolutionary, patented LithoPlus Coater, you save time, money and space, while improving quality and profits. Available with blanket and plate clamping systems and optional pin registration.



W018984

The Dahlgren Coater/Damper, the industry's first inline coater (1972), converts from a damper to a coater in a matter of minutes. Also available with differential drive, our coater/dampers offer the visual appeal of coated sheets with the efficiency and clarity only Dahlgren can provide.

The Dahlgren Web Coater allows you to apply U.V. catalytic or aqueous coatings to the web. It's versatile and compact. It easily fits inline. And its simple operation enhances productivity while delivering the coating quality you focus on to meet demand.



In 1956, Harold Dahlgren invented the brush damper for web offset printing. His ideas have since revolutionized the efficiency and productivity of printers everywhere.

In 1910, The Freiburger Zeitung is the first newspaper to use rotary photogravure press. Dahlgren's list of firsts includes skewed rollers and in-line coating.

Throughout the 1950s, Dahlgren will continue to carry out its tradition of quality service and competitive excellence. For the greatest performance in printing, turn to Dahlgren.

DAHLGREN IMPROVES YOUR IMAGE

None offers a broader line of coaters and dampers than Dahlgren. So, no secret. We also offer the accessories you need to achieve even greater results. Our people are constantly working to improve the performance of today's spinning technology. And with each revolution, we reinforce our leadership position.

Dahlgren UV/IR/Water-Cooled Drying Systems protect your press from heat while curing or drying ink and coatings on virtually any substrate.

The Dahlgren Ghost Chaser provides a smoother, more uniform ink laydown for less ghosting and streaking, with improved color and reduced waste.

As a custom engineering firm, Dahlgren combines the finest technology with the latest design, numeric and computer-aided technology — computer-aided design, numeric and computer-aided manufacturing — to provide responsive one-of-a-kind manufacturing capabilities for your specialized needs. We stock thousands of parts, maintain on-line inventory systems and provide prompt shipping schedules to ensure your ultimate satisfaction. In effect, we're your full-service resource for everything from engineering to manufacturing to installation and training. At Dahlgren, you get it all.

Dahlgren Coater and Dampening Circulation Systems are designed to save space and provide optimum and efficient control of toner solutions and/or coatings to keep your presses running at the absolute peak efficiency.

Put Dahlgren ingenuity to work for you. With more than 180 patents issued to our credit, and more than 70,000 proven coating and dampening systems in operation worldwide, Dahlgren is without question the leader in the industry.

Based in Carrollton, Texas, Dahlgren USA represents the full manufacturing, engineering, service, sales and installation team you need to improve your printing performance. Our people can work directly with you to custom-engineer any system that answers your needs exactly. And our factory-trained service technicians provide installation and training necessary to get your system up and running fast. We guarantee your satisfaction. We will.

invite you to discover the quality, efficiency and performance that has made Dahlgren the most respected name in printing today.

Coating Guide
Front & Back Covers
have been
both aqueous and
UV coated.
Page 2
no coating
Page 4, 5
Aqueous coating only
Page 6
UV coating only
This brochure was
produced using a
Dahlgren UV/IR
coating system.

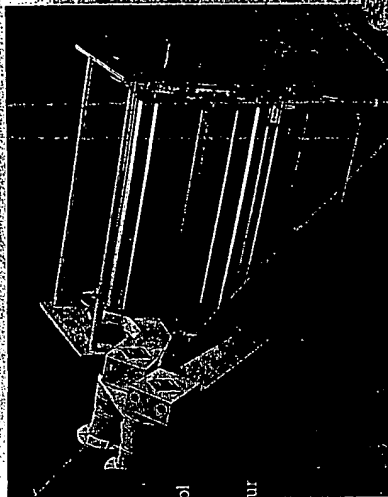
P.O. Box 115140
Carrollton, TX 75010
(214) 245-0036
1-800-527-5301
Fax (214) 245-0768

A new, light, graceful style of illustration emerges from Colson's corporate texts in 1930. Over the years, advances such as hydrophilic rollers have resulted from Dahlgren testing.

1700

Rowley secures last English patent on colored printing rolls in 1772. Precise metering of the ink/water balance is what makes Dahlgren dampeners the choice for successful presses now.

Alvin Sorensen discovered photography in 1798 based on the principle that ink and water don't mix. Years later, Dahlgren vastly improves this technology with the first continuous-duty dampening system.



The Dahlgren High Speed Web Dampener provides the ultimate in enhanced productivity and performance. Precise water control eliminates amplification for stronger colors and improved print quality. It won't limit your press speed, and it's simple to adjust and operate, as well as easy to maintain.

The Dahlgren 4-Roll Dampener with Differential Drive offers all the advantages of our 3-Roll design, plus it maximizes ink capacity for stronger colors and smoother solids. These precise metering and "hickey" removal features ensure clean print quality for less waste with fewer rejects. Plus, its unique combination of nips will reduce or eliminate the amount of alcohol used, while its oscillating bridge roller and additional form roller dramatically reduce ghosting.

The Dahlgren 3-Roll Dampener represents the industry's first continuous-duty dampener. It's the least expensive of our line, yet it adjusts with all the ease and performs with all the durability, simplicity and quality you can expect whenever you run with a Dahlgren.

W019993

Increase Profit and Expand Your Market with Dahlgren's Retrofit Coaters

Ask Ariel Schmidt, president of Clinton, MA-based Atlantic Graphic Services (AGS) what he thinks about the patented new LithoPlus coater from Dahlgren, and he'll tell you: "The LithoPlus has given us an edge. By allowing us to print and coat inline, it has enabled us to deliver a better-looking and better-feeling product in the same amount of time we normally used to print."

As the only coater in production that allows you to add coating to your press, without losing that unit's ability to print and coat at the same time, the LithoPlus is making a believer out of many printers.

AGS is just one example. Facing tough economic times, the New England printer needed to find new ways of maintaining a profitable business. Two seemingly counter-solutions emerged: lower overhead; and expand services. At first, it seemed an impossible task. But as the company explored its options, the LithoPlus coater proved worthy. By allowing AGS to print and coat inline, the company was able to save time and cost, and avoid loss of control when farming-out coating jobs.

Says Ariel: "Despite the economy, we're able to run two shifts on our Mitsubishi six-color press. We can deliver the jobs one or two days sooner, and the cost to coat is less than a penny per press sheet. At that rate, we're more than able to cover our capital investment and

make a profit, while giving our customer a higher-quality product."

AGS coats virtually 100 percent of the output from its Mitsubishi press. AGS has now installed a second LithoPlus on its two-color Heidelberg Speedmaster. Sales are up 18 percent, and profits have risen 22 percent.

Says Schmidt: "The feel of the printed sheet and the gloss make a positive impression on customers. Because of coating, our rejection rate has dropped to almost zero. We've also saved on freight and the hassle of dealing with outside specialty suppliers."

Currently available for the Heidelberg Speedmaster and Mitsubishi sheetfed presses, the LithoPlus is equipped with plate clamps for precision spot coating. Each installation is engineered to customer specifications.

Dahlgren also offers the industry's top-selling blanket coater. This single anilox roll coater features the same coating head as the LithoPlus system. No other coater can lay down more coating with more uniformity. Set-up takes only five minutes, clean-up only ten. Slinging, streaking and orange-peeling are eliminated. And with more than 200 installations worldwide, the Dahlgren blanket coater is a proven performer.

Web coaters for overall coating in one- or two-sided jobs are also available from Dahlgren. These allow aqueous or UV coating to be applied inline on webs up to 66 inches, at

speeds up to 2,000 fpm.

Meanwhile, sheetfed presses can still benefit from Dahlgren's traditional coater/dampener technology. Dahlgren's new differential drive coater/dampener combines the advantages of the new differential drive dampener — eliminating hickeys, ghosting and alcohol — with Dahlgren's coating system.

Dahlgren engineers have also converted one- and two-color presses into productive off-line coating systems, working with such models as Harris, OMSCA, Miller and Miehle/Roland. Its technical staff can help with virtually any unique coating system, from two-roll coaters to plate coaters. And as with all Dahlgren

equipment, each product is covered by Dahlgren's guarantee that if the unit doesn't perform to customer satisfaction, Dahlgren will remove it and provide a full refund.

So if you'd like to improve the overall quality and profitability of your printing business, consider the words of Ariel Schmidt: "When it comes to service, Dahlgren is it."

For more information, call 800-527-5301, write Dahlgren USA, 1725 Sandy Lake Rd., Carrollton, TX 75006.



David Linton adjusts AGS' Dahlgren LithoPlus coater.

DAHLGREN'S COATER CHALLENGE: \$1,000,000.00

Dahlgren invites other coater manufacturers to put up or shut up.

At Dahlgren, we're so sure our patented Blanket Coater is the best in-line sheet-fed blanket coater on the market today, we'll pay any manufacturer \$1,000,000 if they can prove their coater lays down more coating, more uniformly, at production speeds with less trouble than ours. Just run the same blankets, coating, and stock under the same conditions, and if Dahlgren doesn't come out on top, we'll pay \$1,000,000 on the spot. It can't be done.

What does that mean if you're in the market for a new press or retrofit coater? It means that if any coater or press manufacturer tells you their coater is better than the Dahlgren Blanket Coater, they're not telling you the truth. Here's why:

"The Dahlgren Blanket Coater is the most advanced, most proprietary technology with more than 20 years of coating experience to bring you the best coater money can buy. Period."

We've seen it happen too many times. Other coaters are sold or purchased by manufacturers who claim they're coating unit or units better than Dahlgren's. But when they run the same blankets, coating, and stock under the same conditions, they find they can't match Dahlgren's performance. They're forced to slow down production speeds, waste stock, reject, and lost time means these same pointers result with the Dahlgren Blanket Coater.

Suddenly, they get results. Why?

Dahlgren was the first company to put a coater in line on a press. Since then, we've perfected the process using a simple, easy-to-use design that features an anilox roll and doctor blade configuration for maximum coverage and uniformity. This single-roll design makes the Dahlgren Blanket Coater simpler and more reliable than other, more complex designs. No other coater even comes close.

"Dahlgren's unique, rugged, single-roll design eliminates the problems of orange-peel, slinging, and ridging common to multiple roller coaters."

The magic behind the Dahlgren Blanket Coater is simple. Our single anilox roll coat head uniformly carries more coating to the blanket and sheet than any combination of rubber or chrome surfaces can possibly carry. That's because each anilox roll can cups the coating, carry it more and losing less. When the coating is applied to the roll, a special doctor blade uniformly removes excess coating from the roll surface and returns it to the nip for replenish. Now the coating is then applied to the blanket from the roll. Competitive coaters return any excess coating to a roller train, causing non-uniformity, ridging, slinging, and fading from gripper marks.

Our coater is hydraulically locked to the press to ensure

rigidity and eliminate the chattering effect you may find on other coaters. What's more, you can run at full production speeds for maximum productivity. One million dollars says you can't do better than that.

"Quality always pays. Which is why the Dahlgren Blanket Coater is the best investment you can make in a coating unit. And you can take that to the bank."

Whether you're running U-V, water base, blister seal, or specialty coatings, you won't find a better way to apply it in-line than with a Dahlgren Blanket Coater. No matter what our competitors would like you to believe, remember Dahlgren:

- Lowers your cost
- Improves your production
- Can eliminate spray powder
- Increases your customer satisfaction
- And offers a money-back guarantee.

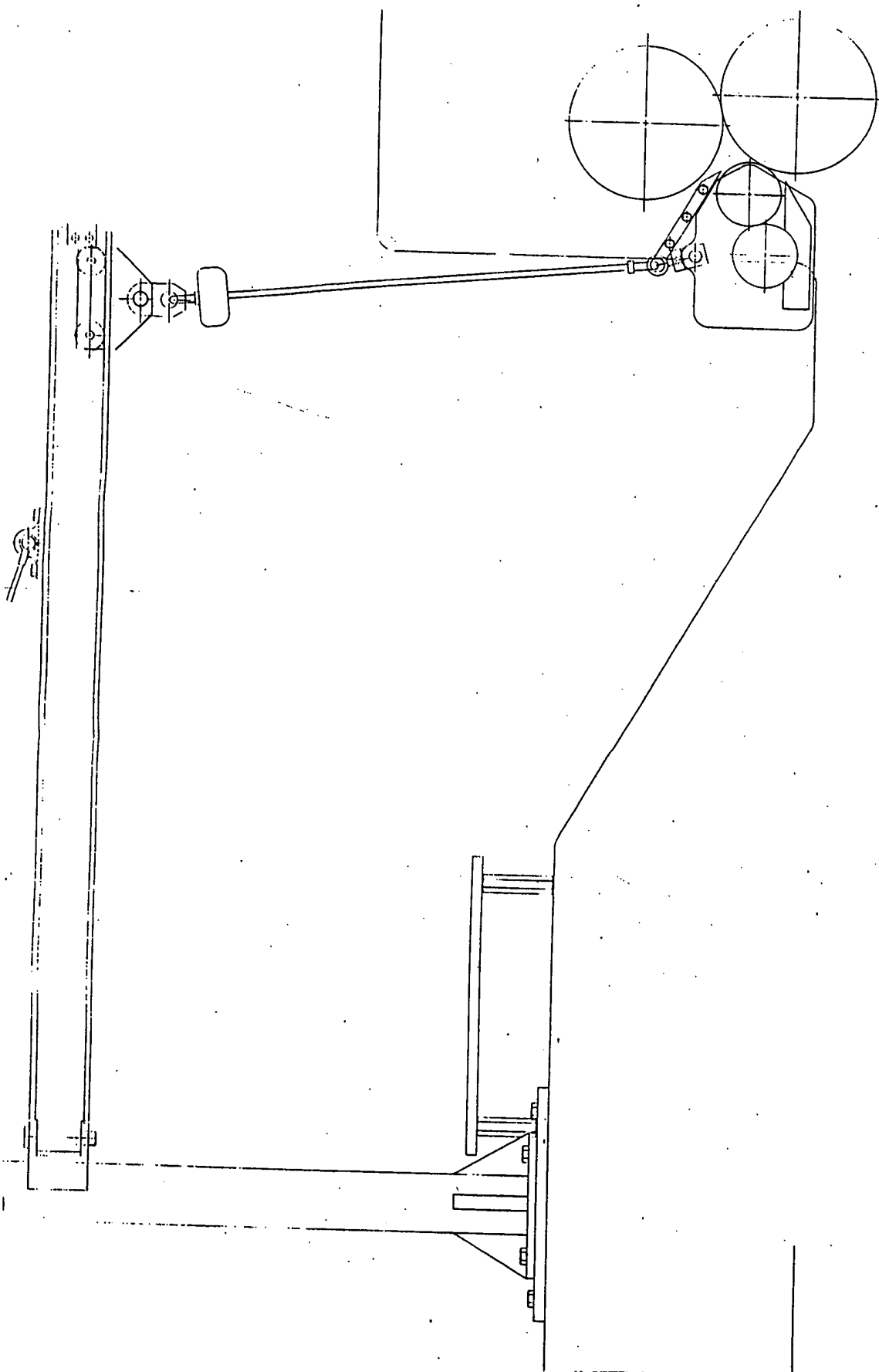
If you're a manufacturer with a tall tale to tell, put up or shut up. Take the Dahlgren \$1,000,000.00 challenge. If you're in the market for a coater, don't take a chance. Buy a Dahlgren. One roll outshines them all.

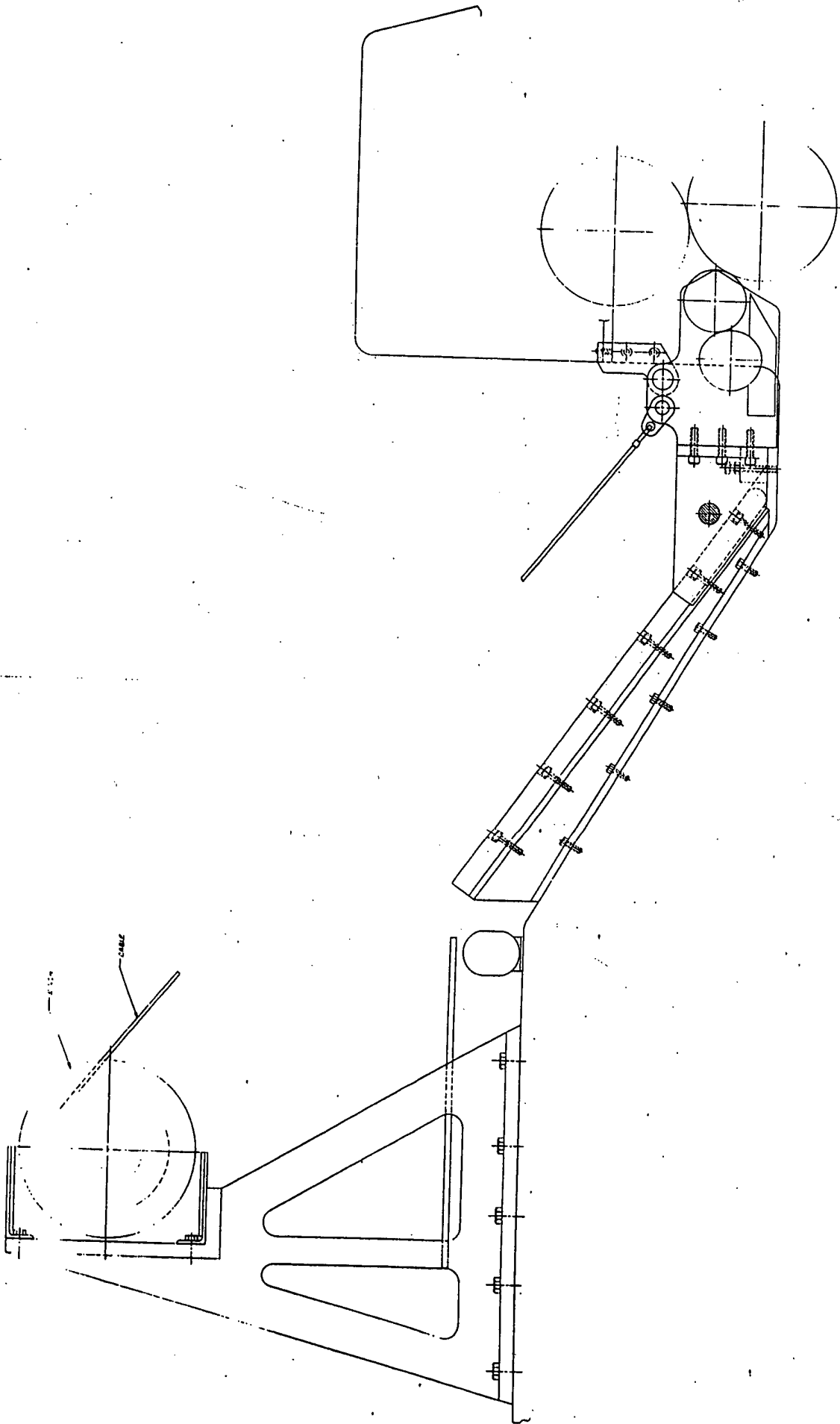
P.O. Box 115140 Carrollton, TX 75011
(214) 245-0035 • Fax (214) 245-0788

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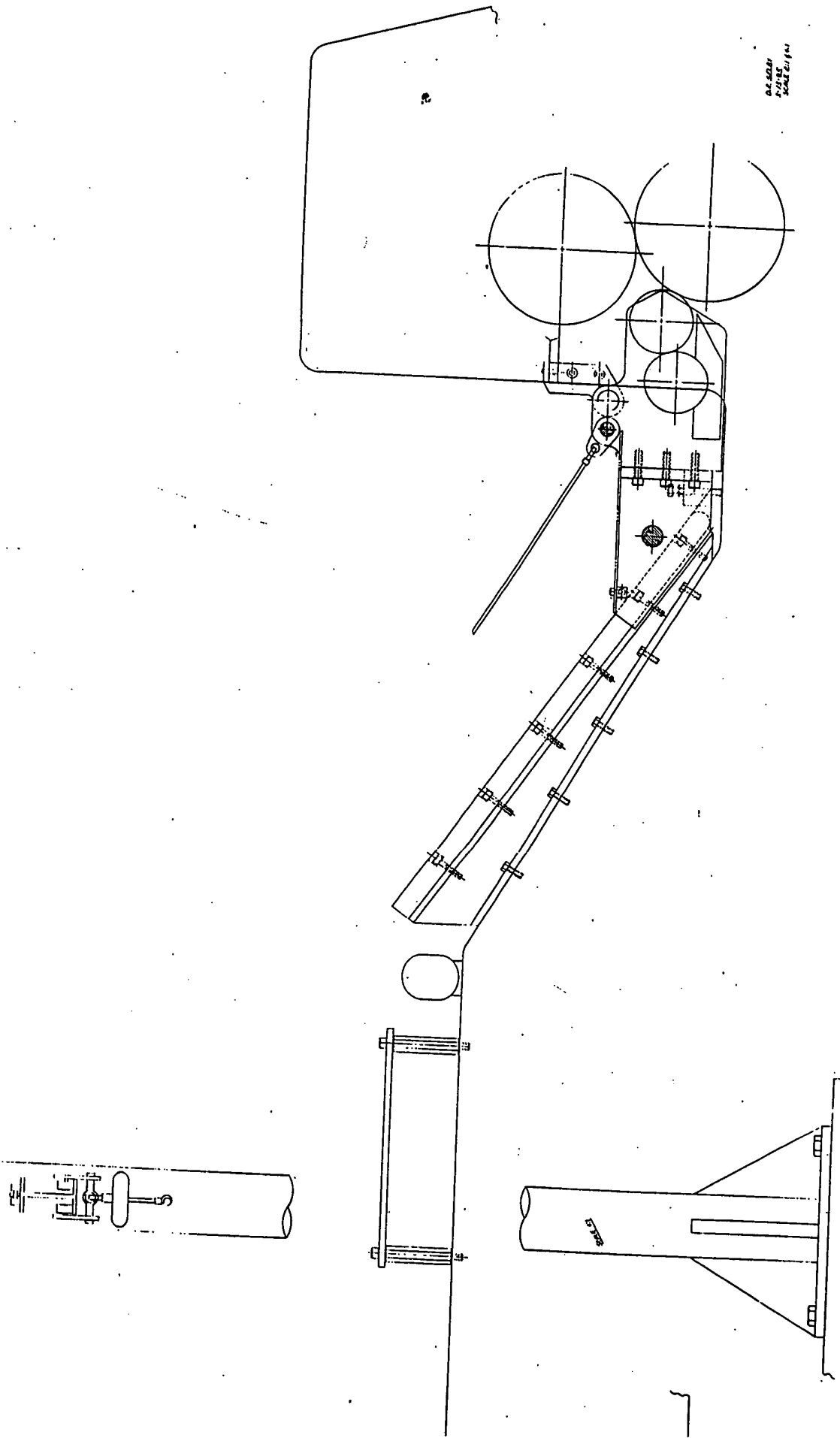
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2 1/2" x 1 1/2" x 1/4" 304 SS

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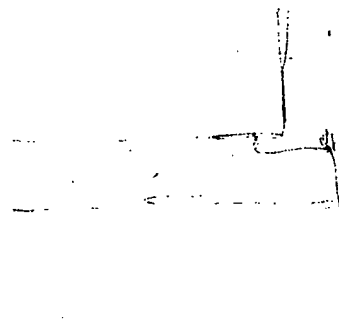
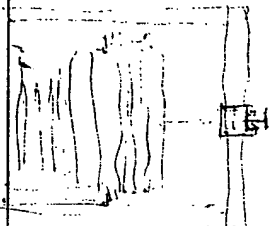
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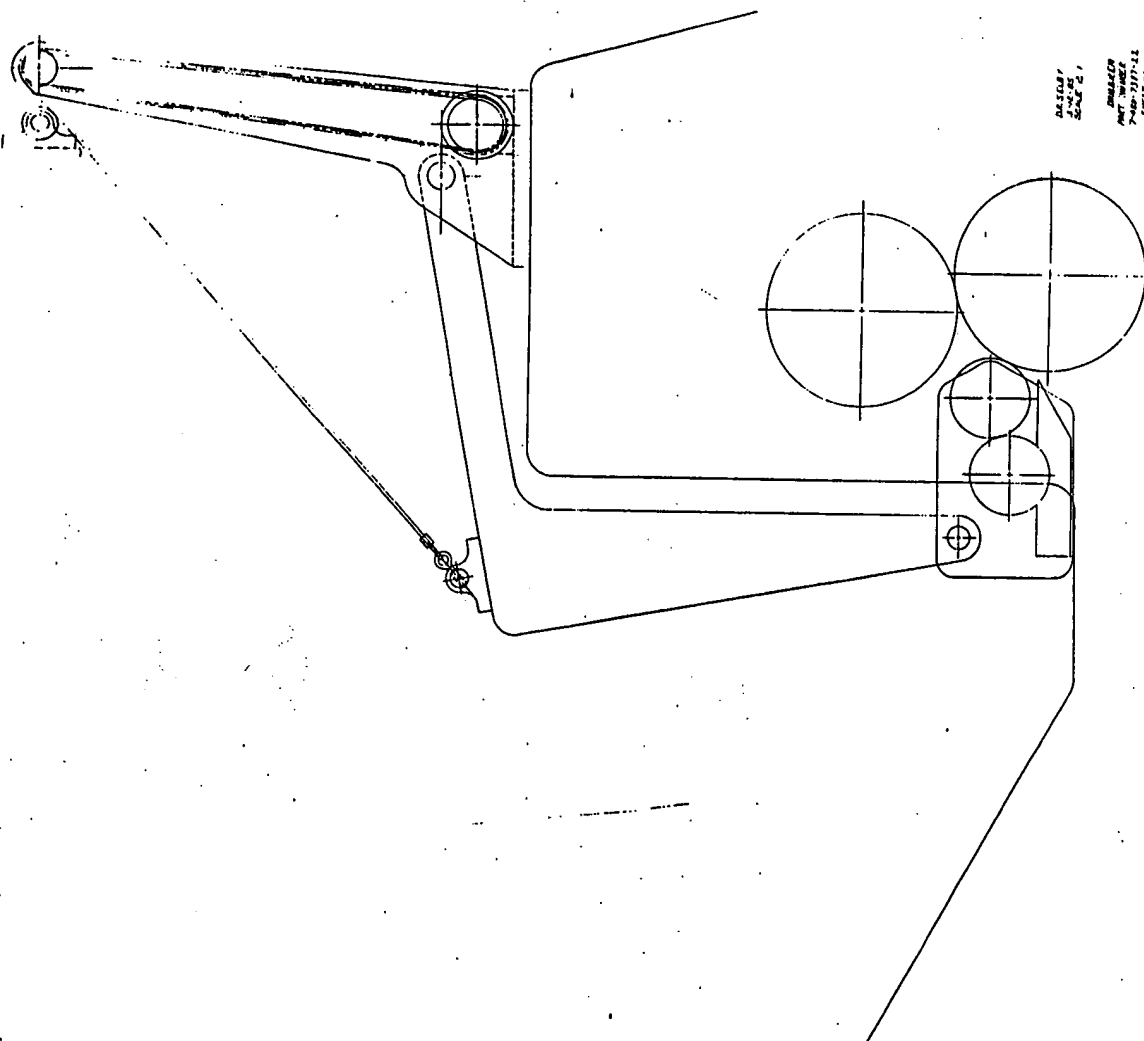


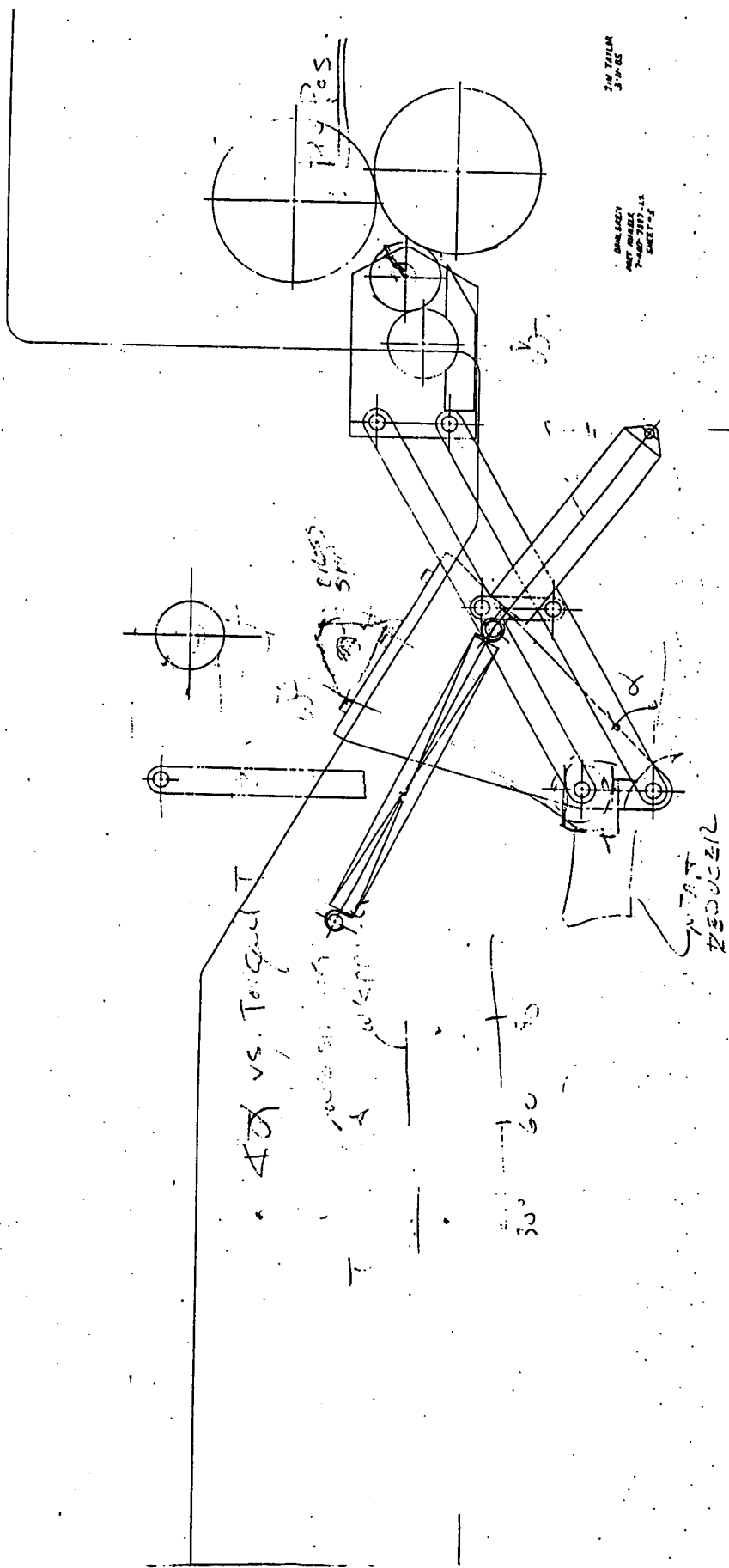
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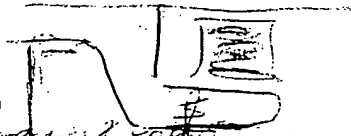
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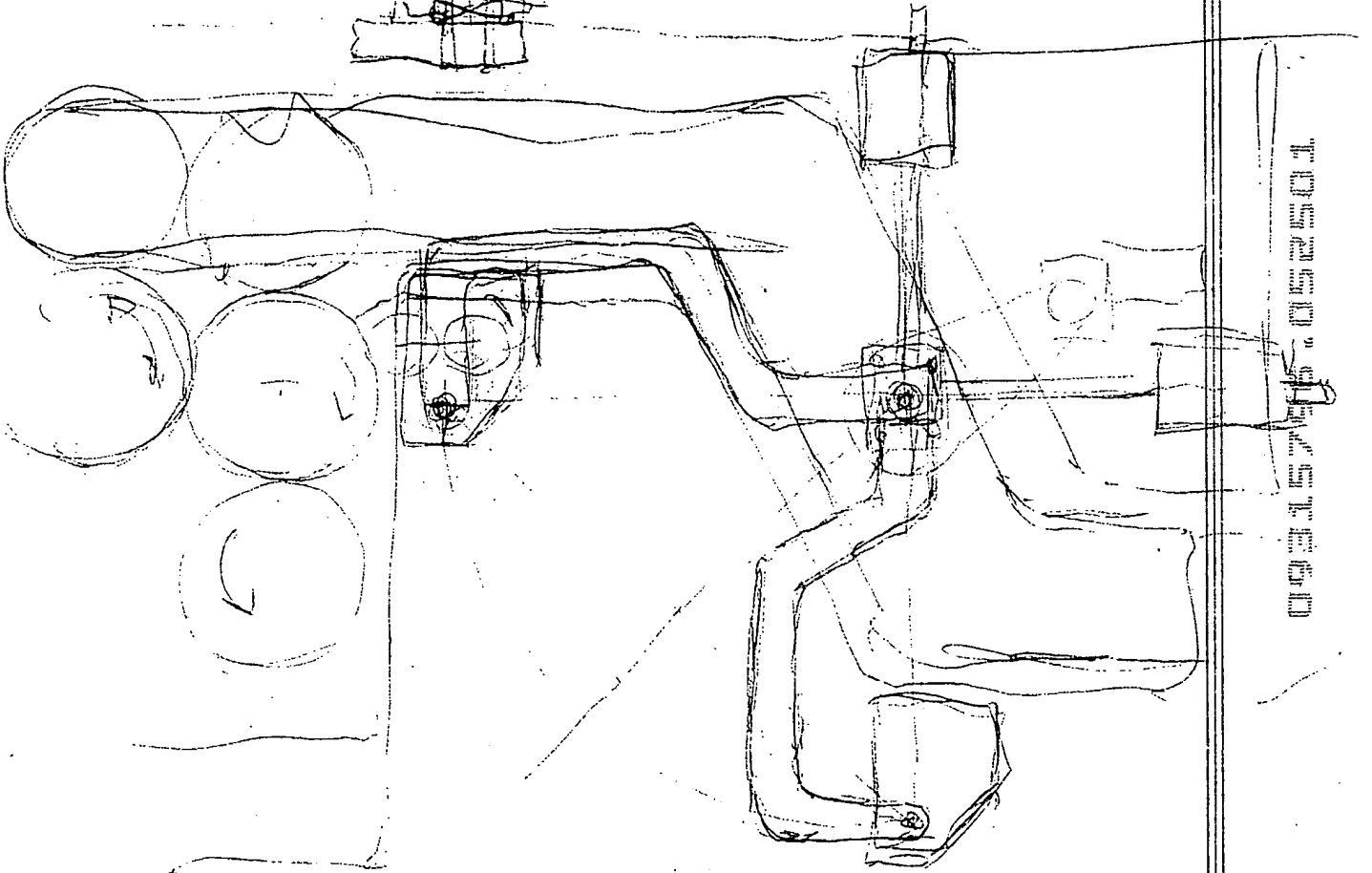


Removable Attachments

0. None (Stationary)
- ① { 1. Churn Picker (Floor Mtd.)
2. " " (Floor Mtd.)
- ② { 3. Overhead Rail & Motor (Floor Mtd.)
4. " " (Floor Mtd.)
- ③ { 5. Vertical Hoist (Floor, or Floor Mtd.)
6. Rotating Drum (Floor Mtd.)
- ④ { 7. Herringbone & Side Movement (w/ cart)
8. Rack back @ angle
9. Foundation (w/ cart) (6/12) 235-3858



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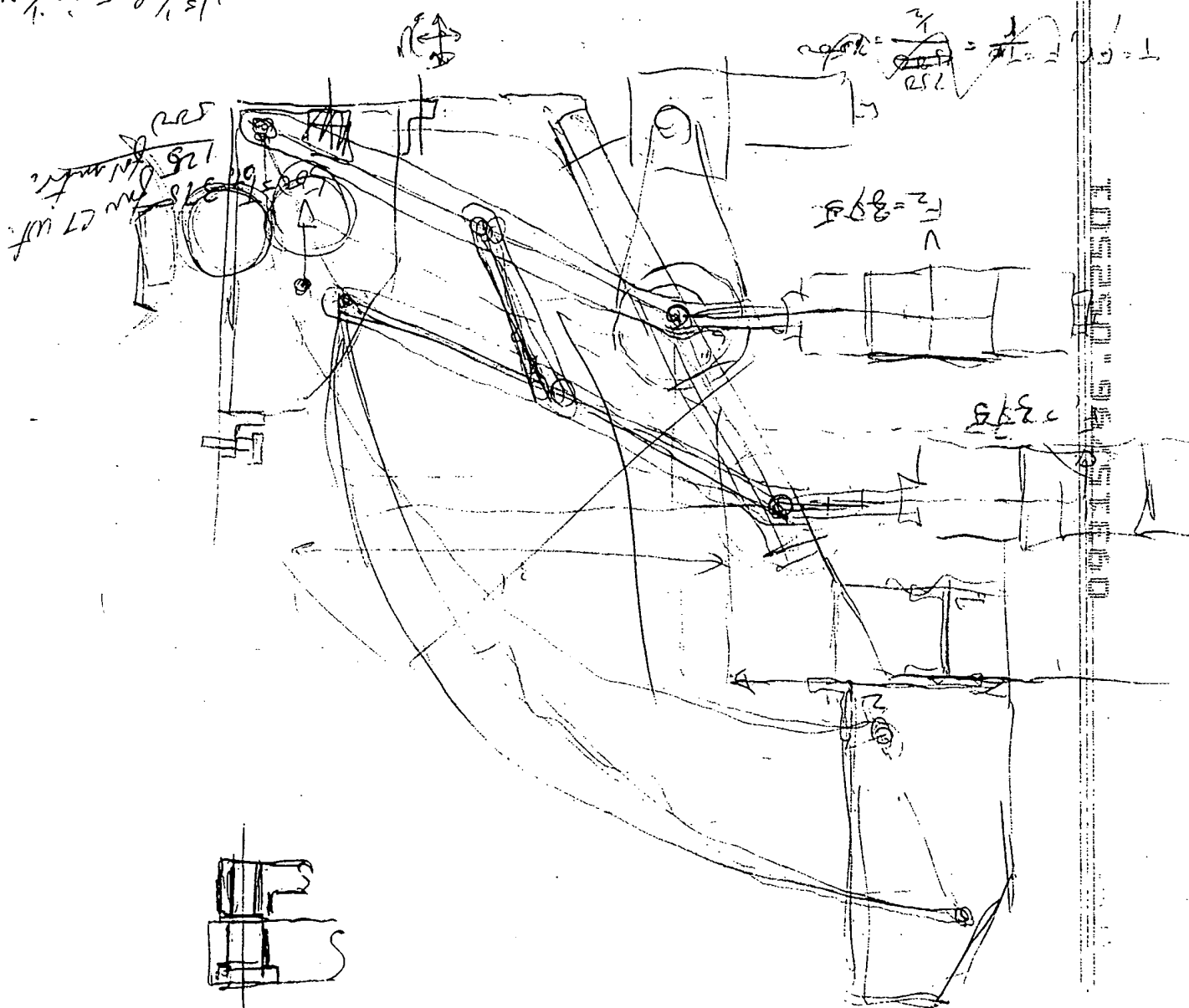


Structure
4th floor
130 unit 1000

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9668TOM

The 12:00 PM
 Session of "Solving"
 that involves a bunch

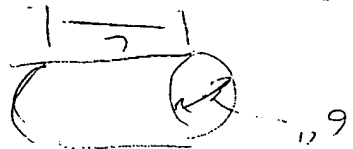


$T = FV$
 $F = 3(375) = 1125 \text{ ft}\cdot\text{lb}$

$F_1 + F_2 = 550$
 $F_1 = F_2 = 275$

$T = FV$
 $F = 538$
 $F_1 = F_2 = 269$

$V = 8(6) = 48$
 $W = VD$
 $L = 296$



$P = \frac{T}{R} = \frac{1500(1)}{12} = 125$

$1 \text{ RPM} = 1 \text{ rev/min}$

$V = \frac{1}{3} \text{ rev/min}$
 1 rev/min

W018997

105250-96251E60

⊙ = cross shaft

$\frac{1}{2}$ in

$$F = PA$$

$$P = \frac{F}{A} = \frac{1500}{3} = 500 \text{ PSI}$$

$$A = \frac{P}{F} = \frac{1500}{500} = 3$$

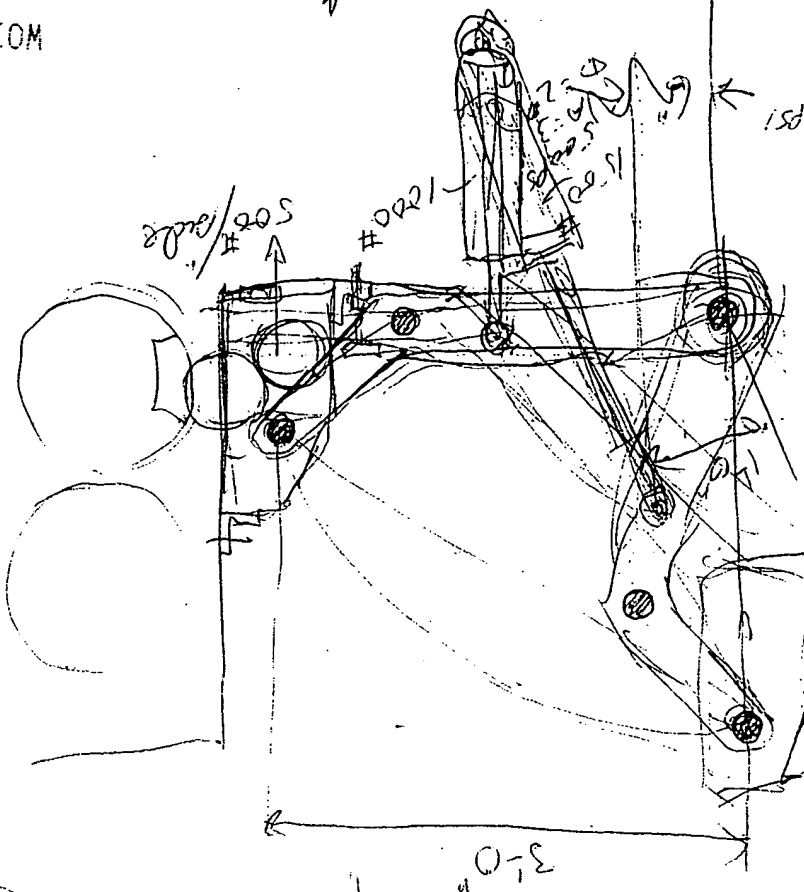
$$F = PA = 500$$

$$A = \pi r^2$$

$$r = \sqrt{\frac{A}{\pi}} = \sqrt{\frac{3}{\pi}} = 1.1 = 1 \frac{1}{8} = 1 \frac{1}{2}$$

$$D = 2r = 2$$

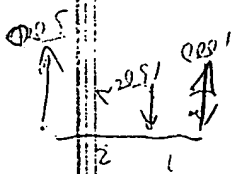
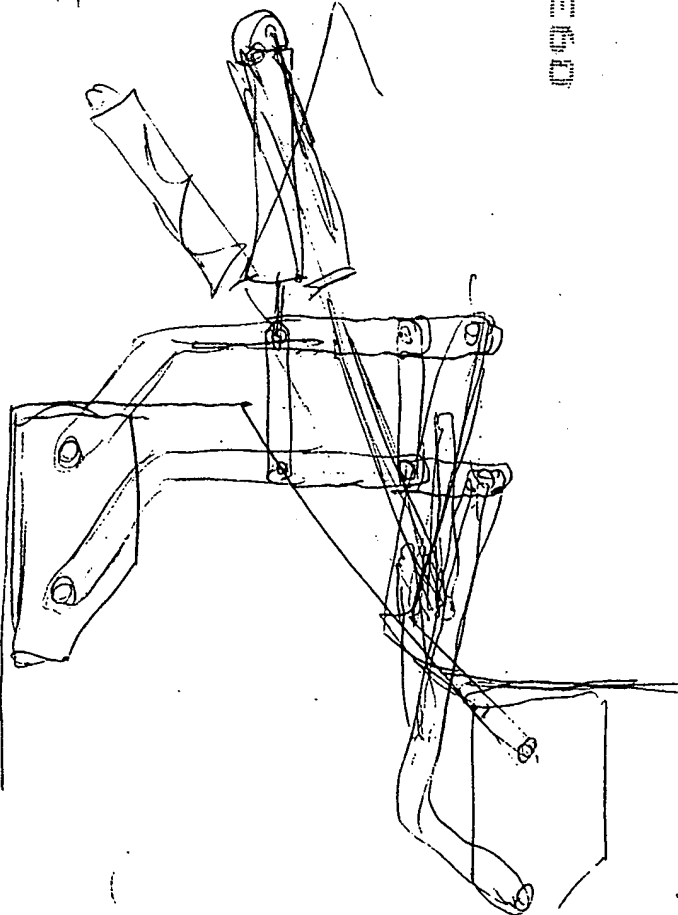
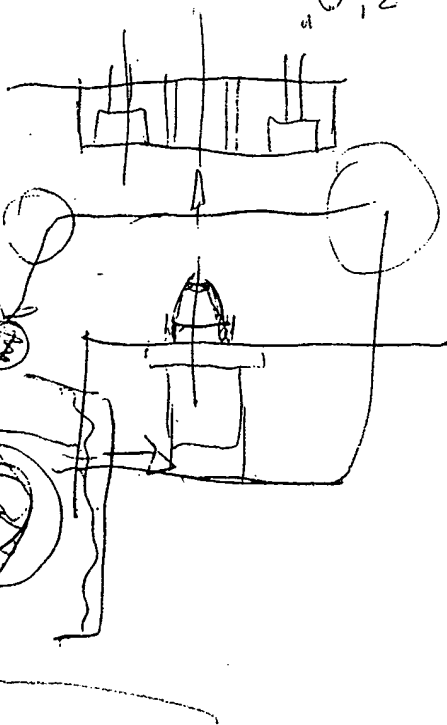
1'-6"



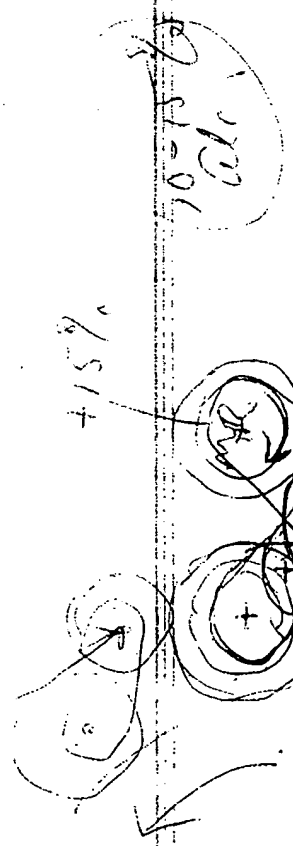
500 #/side

1200 #

3'-0"

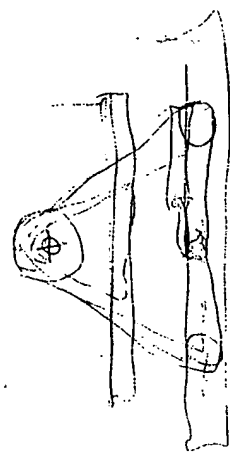


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+15%

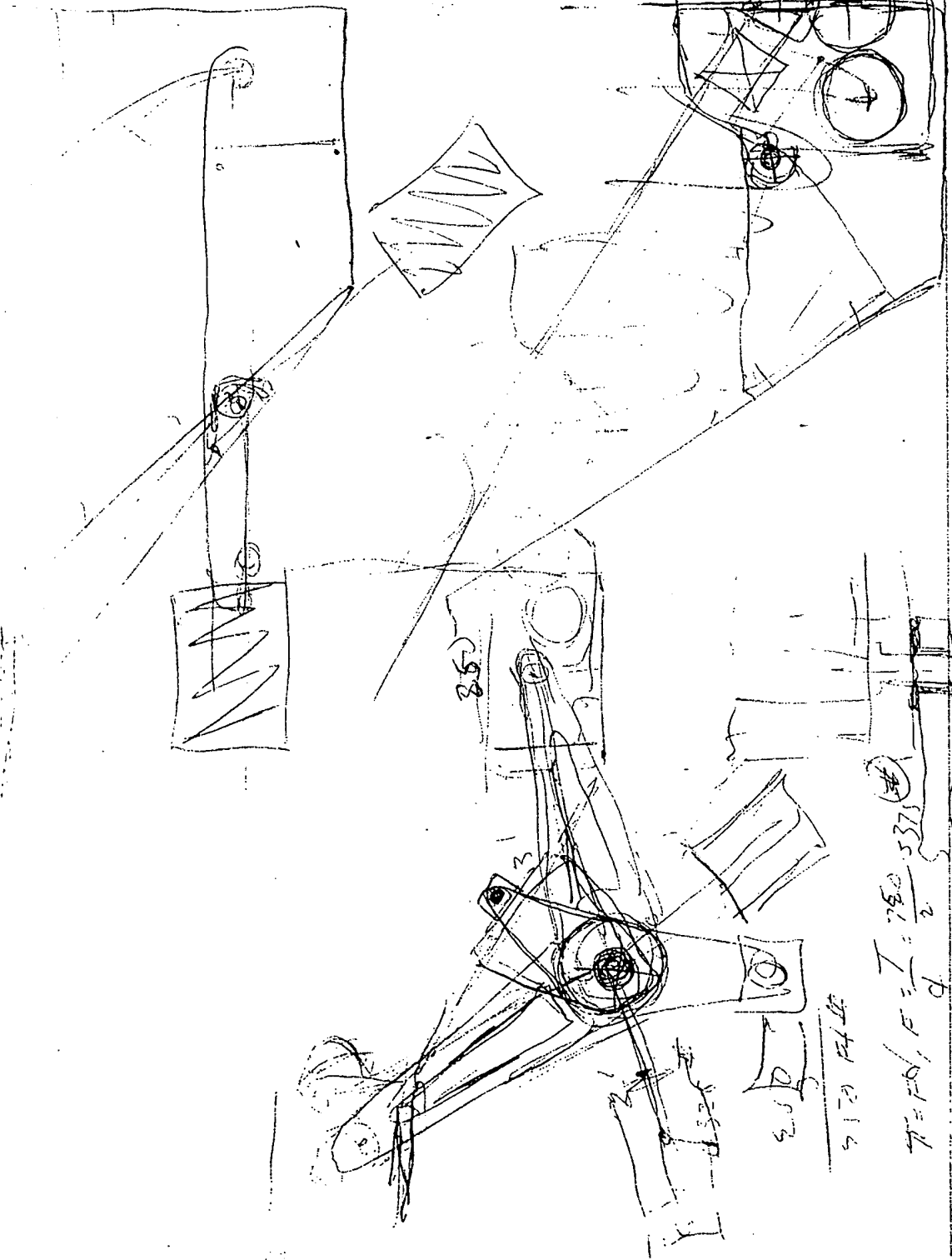
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Adv.



$$(12 \times \frac{3}{4} \times 45) \cdot 1.3$$

$$\begin{array}{r} 100 \\ 101 \\ 101 \\ 101 \\ \hline 403 \end{array}$$

$$\begin{array}{r} 220 \\ 220 \\ \hline 440 \end{array}$$



35

$$F = \frac{T}{d} = \frac{750}{2} = 375$$

$$36 \times 10^{-20} \times 10^{20} (1.7) = .8(720) \cdot 7 = 320(1.52)$$

$$\begin{array}{r} 4520 \\ 3100 \\ \hline 35320 \end{array}$$

09315796-052501

052591



57
6000
1200

A hand-drawn sketch of a building layout, possibly a floor plan or a site plan. The drawing is oriented vertically on the page. It shows a central rectangular area with several smaller rectangular structures attached to its sides. There are numerous lines, arrows, and handwritten notes. At the top, the word "Simple" is written in a large, stylized font. Below it, the word "POND" is written vertically. Other annotations include "100' 0\"/>

Hand-drawn sketches of various objects, including a cluster of circles, a rectangular structure with internal divisions, and a small box with a circle inside.

MO19000

PRIOR ART

TAB No.	PATENT NO. AND TITLE	ASSIGNEE/INVENTOR	ISSUE DATE
1	U.S. Patent No. 2,279,204 Printing Cylinder	<i>Metal Press Mfg.</i> John P.E. Neilson	04/07/42
2	U.S. Patent No. 2,320,523 Dampening Roll for Printing Presses	<i>The Chandler & Price Co.</i> Joseph F. Jirousek	06/01/43
3	U.S. Patent No. 2,333,962	Thomas A. Terry	11/09/43
4	CH 319962 Farbwerk für Buchdruck; Offset druck-und dergleichen Maschinen für Farbendruck	<i>Maschinenfabrik Winkler, Fallert & Co. AG</i> Paul Heimlicher	03/15/57
5	Great Britain Patent No. 924401 Improvements in or relating to Ink Supplying Means for Rotary Printing Machines	Ernest Arthur Timson	04/24/63
6	U.S. Patent No. 3,397,675 Coating Apparatus	<i>West Virginia Pulp & Paper Co.</i> John De Ligt	08/20/68
7	U.S. Patent No. 3,433,155 Mechanism for Applying a Coating to a Plate	<i>Harris Intertype Corp.</i> Robert K. Norton	03/18/69
8	U.S. Patent No. 3,536,006 Multicolor Rotary Offset Printing Press with Cylinder Interruption	<i>Vandercook & Sons, Inc.</i> James Burton Roozee	10/27/70
9	U.S. Patent No. 3,604,350 Flexographic Presses with Interrupter and Cylinder Register Mechanisms	Lawrence Rosenstadt	09/14/71

TAB No.	PATENT NO. AND TITLE	ASSIGNMENT INFORMATION	ISSUE DATE
10	U.S. Patent No. 3,749,011 Damping Device for Lithographic Printing Presses	<i>Roland Offsetmaschinenfabrik Faber & Schleicher AG</i> Paul Abendroth, Hans Alix, Friedrich Preuss, Fred Kunkel	07/31/73
11	U.S. Patent No. 3,768,438 Machine for Coating Sheets of Paper and the like with Liquid Coating Materials	Wilhel Kumpf	10/30/73
12	U.S. Patent No. 3,800,743 Materials Application Apparatus	<i>Xerox Corporation</i> Raymond K. Egnaczak	04/02/74
13	U.S. Patent No. 3,916,824 Device for Coating Strip Material in Continuous Operations	<i>Aluminum Norf GmbH</i> Peter Knodel, Gerhard Mayer, Horst Munsterer, Reinbold Wagner	11/04/75
14	U.S. Patent No. 3,931,791 Mechanism for Applying Lacquers and the like on a Printing Press	<i>Roland Offsetmaschinenfabrik Faber & Schleicher AG</i> Friedrich Preuss and Kurt Difflipp	01/13/76
15	U.S. Patent No. 3,986,452 Liquid Applicator for Lithographic Systems	<i>Dahlgren Manufacturing Company, Inc.</i> Harold P. Dahlgren	10/19/76
16	DE 21 51 185 B2 Mechanism for Applying Laquers and the like on a Printing Press	<i>Maschinenfabrik Augsburg- Nurnberg AG</i> Hermann Fischer	07/19/79
17	U.S. Patent No. 4,165,688 Ink Dam for Printing Press	<i>Magna-Graphics Corporation</i> Dale D. Leanna and Allen R. Jorgensen	08/28/79
18	U.S. Patent No. 4,222,325 Mounting Means for Movable Carriage on an Offset Press	<i>White Consolidated Industries, Inc.</i> Robert Edwards	09/16/80
19	U.S. Patent No. 4,270,483 Printing Coater	Denton G. Butler and Andrew W. Lester	06/02/81

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Pat. No.	Patent Title	Assignee/Inventor	Issue Date
20	U.S. Patent No. 4,308,796 Offset Lithographic Press with Ink Metering System for Blanket Cylinder	<i>S-W-H Ltd.</i> William L. Satterwhite	01/05/82
21	U.S. Patent No. 4,372,244 Varnishing Units on Printing Presses	<i>M.A.N.-ROLAND</i> <i>Druckmaschinen AG</i> Herbert Rebel	02/08/83
22	U.S. Patent No. 4,379,039 Ultraviolet Curable Resin Composition	Toyo Boseki Kabushiki Kaish Hiroshi Fujimoto, Hideo Miyake	04/05/83
23	U.S. Patent No. 4,396,650 Primed Inorganic Substrates Overcoated with Curable Protective Compositions	<i>Minnesota Mining & Mfg. Co.</i> Roger W. Lange, Alek P. Szecsy	08/02/83
24	U.S. Patent No. 4,397,237 Roller Train Structure for use with Printing Machine	<i>M.A.N.-ROLAND</i> <i>Druckmaschinen AG</i> Manfred Makosch	08/09/83
25	U.S. Patent No. 4,399,767 Varnishing Unit in the Delivery Unit of a Sheet-Fed Rotary Printing Press	<i>M.A.N.-ROLAND</i> <i>Druckmaschinen AG</i> Claus Simeth	08/23/83
26	U.S. Patent No. 4,402,267 Method and Apparatus for Handling Printed Sheet Material	<i>Printing Research Corporation</i> Howard W. DeMoore	09/06/83
27	U.S. Patent No. 4,421,027 Multiple Printing Mode Printing Machine System	<i>M.A.N.-ROLAND</i> <i>Druckmaschinen AG</i> Hermann Fischer	12/20/83
28	U.S. Patent No. 4,423,677 Rotary Sheet Offset Printing Machine	<i>M.A.N.-ROLAND</i> <i>Druckmaschinen AG</i> Hermann Fischer	01/03/84
29	U.S. Patent No. 4,446,814 Device for Applying a Fluid, in Particular Lacquers on Printed Sheets or Continuous Webs	<i>M.A.N.-ROLAND</i> <i>Druckmaschinen AG</i> Paul Abendroth, Janko Despot	05/08/84

LINE NO.	PATENT NO. AND TITLE	ASSIGNOR/INVENTOR	ISSUE DATE
30	U.S. Patent No. 4,451,509 Radiation-Hardenable Aqueous Binder Emulsions of Acrylate Prepolymer with Unsaturated Polyester Emulsifier Having Benzyloxy and Alkylene-Oxy Groups	<i>Bayer Aktiengesellschaft</i> Walter Frank, Otto Bendszus, Jurgen Meixner, Hans J. Freier, Hans-Jaachim Traenckner	05/29/84
31	U.S. Patent No. 4,501,223 Coating Apparatus	<i>Hitachi Zosen Corporation</i> Sadayuki Matsuno, Hiroshi Itoh, Isamu Nishikawa, Tatsuo Awazu, Toshio Matsunaga, Yoshitaka Kitaoka, Goro Sugimoto, Hiroki Nishinaka	02/26/85
32	U.S. Patent No. 4,524,712 Varnish Coater for Printed Product	<i>Komori Printing Machinery Co., Ltd./Kiyoshi Ito</i>	06/25/85
33	U.S. Patent No. 4,536,218 Process and Compositions for Lithographic Printing in Multiple Layers	Eli A. Ganho	08/20/85
34	U.S. Patent No. 4,569,306 Varnish Coater for Printed Product	<i>Komori Printing Machinery Co., Ltd.</i> Kiyoshi Ito, Tamotsu Omori	02/11/86
35	U.S. Patent No. 4,574,732 Overvarnish Unit	<i>Feco Engineered Systems, Inc.</i> William G. Verwey, John C. Hovekamp	03/11/86
36	U.S. Patent No. 4,586,434 Device for Replacing Plate Cylinders	<i>Rengo Co., Ltd.</i> Masateru Tokuno, Tetsuya Sawada, Hidetoshi Hoshiyama, Toshihiro Yoneda	05/06/86
37	U.S. Patent No. 4,615,293 Medium-Appling Device in a Printing Machine	<i>Heidelberger Druckmaschinen AG</i> Hans-Georg Jahn	10/07/86

Pat. No.	Patent Description	Assignee/Inventor	Issue Date
38	U.S. Patent No. 4,617,865 Liquid Coater for a Printing Press with Moveable Inking Roller and Tray	<i>Ryco Graphic Mfg., Inc.</i> Thomas G. Switall	10/21/86
39	EP 0270 054 A2 Slip Sheet Insertion-Delivery Apparatus for Sheet-Fed Printing Press	<i>Komori Printing Machinery Co.</i> Toshio Hoshi	12/04/86
40	EP 0293 586 A2 Geteilter Farbkasten für eine Flexodruckmaschine	<i>M.A.N. - ROLAND</i> <i>Druckmaschinen AG</i> David J. Sarazen	05/29/87
41	U.S. Patent No. 4,685,414 Coating Printed Sheets	Mark A. DiRico	08/11/87
42	U.S. Patent No. 4,704,296 Web Coating Method and Apparatus	<i>Magna-Graphics Corp.</i> Dale D. Leanna, Eugene R. Wittkopf, Allen R. Jorgensen	11/03/87
43	U.S. Patent No. 4,706,601 Device for Applying Medium After Termination of Printing Operation in a Printing Machine	<i>Heidelberger Druckmaschinen</i> <i>AG</i> Hans-Georg Jahn	11/17/87
44	U.S. Patent No. 4,753,166 Printing Machine Ink Smoother	<i>M.A.N. - ROLAND</i> <i>Druckmaschinen AG</i> Hermann Fischer	06/28/88
45	U.S. Patent No. 4,779,557 Coater for a Sheet Fed Printing Press	Joseph Frazzitta	10/25/88
46	U.S. Patent No. 4,796,528 Separated Ink Fountain for a Flexographic Printing Machine	<i>M.A.N. - ROLAND</i> <i>Druckmaschinen AG</i> David J. Sarazen	01/10/89
47	U.S. Patent No. 4,796,556 Adjustable Coating and Printing Apparatus	<i>Birow, Inc.</i> John W. Bird	01/10/89

TAB No.	PATENT NO. AND TITLE	ISSUING INVENTOR	ISSUE DATE
48	U.S. Patent No. 4,815,413 Varnishing Apparatus for Printed Sheet	<i>Komori Printing Machinery Co., Ltd.</i> Toshio Kota	03/28/89
49	U.S. Patent No. 4,821,672 Doctor Blade Assembly with Rotary End Seals and Interchangeable Heads	Nick Bruno	04/18/89
50	U.S. Patent No. 4,825,804 Vertically Retracting Coater	<i>Dahlgren International, Inc.</i> Mark A. Dirico, Phillip Rodriguez	05/02/89
51	U.S. Patent No. 4,841,903 Coating and Printing Apparatus Including an Interstation Dryer	<i>Birow, Inc.</i> John W. Bird	06/27/89
52	U.S. Patent No. 4,848,265 Printing Apparatus having Coating Function	<i>Komori Printing Machinery Co., Ltd.</i> Tatsuo Komori	07/18/89
53	U.S. Patent No. 4,852,515 Device for Automatically Controlling Coating Amount for Use in Coating Machine	<i>Chugai Ro Co, Ltd.</i> Yoshiyasu Terasaka, Masao Tanabe	08/01/89
54	U.S. Patent No. 4,882,991 Change-Over Inking Unit of a Sheet-Fed Rotary Press	<i>M.A.N. - ROLAND Druckmaschinen AG</i> Claus Simeth	11/28/89
55	U.S. Patent No. 4,889,051 Removable Inking Device for Offset Press	Jean-Claude Sarda	12/26/89
56	U.S. Patent No. 4,895,070 Liquid Transfer Assembly and Method	<i>Birow, Inc.</i> John W. Bird	01/23/90

TAB No.	PATENT NO. AND TITLE	ASSIGNEE/INVENTOR	ISSUE DATE
57	U.S. Patent No. 4,919,048 Apparatus for Preventing Contact of Wet Ink Sheets with Printing Press Delivery Mechanisms and for Drying Said Wet Ink	Jack D. Tyler	04/24/90
58	U.S. Patent No. 4,934,305 Retractable Coater Assembly including a Coating Blanket Cylinder	<i>Dahlgren International, Inc.</i> Jamie E. Koehler, James E. Taylor	06/19/90
59	U.S. Patent No. 4,936,211 Multicolor Offset Press with Segmental Impression Cylinder Gear	<i>Presstek, Inc.</i> Frank G. Pensavecchia, Richard A. Williams, John P. Gardiner, Stephen M. Laponsey, John F. Kline	06/26/90
60	U.S. Patent No. 4,939,992 Flexographic Coating and/or Printing	<i>Birow, Inc.</i> John W. Bird	07/10/90
61	U.S. Patent No. 4,977,828 Transfer Roller Device for Printing Presses	<i>Printing Research, Inc.</i> David D. Douglas	12/18/90
62	GB 2263 438 A Printing Apparatus	<i>The Langston Company</i> Joseph John Weishew	01/22/92
63	U.S. Patent No. 5,088,404 Delivery Apparatus for Printing Press	Edward P. MacConnell, Shigeki Matsukawa	02/18/92
64	U.S. Patent No. 5,107,790 Two Headed Coater	<i>Rapidac Machine Corp.</i> Larry J. Sliker, Robert S. Conklin	04/28/92
65	U.S. Patent No. 5,127,329 Vacuum Transfer Apparatus for Rotary Sheet-Fed Printing Presses	<i>Howard W. DeMoore</i> Howard W. DeMoore	07/07/92
66	U.S. Patent No. 5,176,077 Coating Apparatus for Sheet-Fed, Offset Rotary Printing Presses	Howard W. DeMoore, David D. Douglas, and Steven M. Person	01/05/93

TAB No.	PATENT NO. AND TITLE	ASSIGNEE/INVENTOR	ISSUE DATE
67	U.S. Patent No. 5,178,678 Retractable Coater Assembly Including a Coating Blanket Cylinder	<i>Dahlgren International, Inc.</i> Jamie E. Koehler, James E. Taylor, Mark A DiRico	01/12/93
68	U.S. Patent No. 5,189,960 Apparatus and Method for Controlling Temperature of Printing Plate on Cylinder in Rotary Press	Fredric Valentini, David W. Moore	03/02/93
69	U.S. Patent No. 5,209,179 Liquid Coating Apparatus for Use in Conjunction with Printing Presses Where Access of the Coating Apparatus to the Press Cylinders is Restricted	<i>Herbert Productions, Inc.</i> John C. Herbert, Frank A. Andaloro	05/11/93
70	EP 0647 529 A1 High Velocity, Hot Air Dryer and Extractor	<i>Howard W. DeMoore</i> Howard Warren DeMoore	10/06/93
71	U.S. Patent No. 5,335,596 Coating Apparatus for Sheet-Fed, Offset Rotary Printing Presses	<i>Howard W. DeMoore</i> Howard W. DeMoore, Steven M. Person	08/09/94
72	DE 4311 834 A1 Einrichtung zum Besshichten von Bedruckstoffen in Druckmaschinen	<i>M.A.N.-ROLAND</i> <i>Druckmaschinen AG</i> Georg Hartung, Ulrich Jung, Juergen Schneider	10/13/94
73	U.S. Patent No. 5,476,041 Printing Press Having a Device for Controlling the Air in a Sheet Feeder	<i>Heidelberger Druckmaschinen</i> <i>AG</i> Ernst Czotscher	12/19/95

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Bezeichnung: Einrichtung zum Aufbringen von Puder auf einen Gegendruckzylinder

71

Anmelder: Maschinenfabrik Augsburg-Nürnberg AG, 8900 Augsburg

72

Erfinder: Fischer, Hermann, 8900 Augsburg

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Patentansprüche:

1. Einrichtung zum ständigen Aufbringen von Puder auf einen Teil der Mantelfläche eines Gegendruckzylinders einer Bogendruckmaschine und zum Abgeben des Puders an die Rückseite des Druckbogens mit einer an einem außerhalb der Bogenführungsbahn für den Druckbogen gelegenen Umfangsbereich des Gegendruckzylinders angeordneten Puderauftragung, dadurch gekennzeichnet, daß der Teil der Mantelfläche des Gegendruckzylinders (25) zur Aufnahme einer gleichmäßig haften bleibenden Puderschicht ausgebildet ist, auf welchen die nicht zu bedruckende Rückseite des Bogens zu liegen kommt.

2. Einrichtung nach Anspruch 1, dadurch gekennzeichnet, daß der Teil der Mantelfläche des Gegendruckzylinders (25) aufgerauht ist.

3. Einrichtung nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß zur Auftragung der Puderschicht eine Duktoralze (19) ständig in einen Behälter (18) eintaucht und ständig an einer Auftragswalze (20) anliegt und daß eine an der Duktoralze (19) anliegende Abstreifwalze (21) vorgesehen ist.

4. Einrichtung nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Puderauftragung durch eine Sprühanlage erfolgt.

5. Einrichtung nach einem der Ansprüche 1 bis 4, dadurch gekennzeichnet, daß die Puderauftragung taktmäßig schaltbar ist.

6. Einrichtung nach Anspruch 3 oder 5, dadurch gekennzeichnet, daß die Auftragswalze (20) durch eine Kurvensteuerung (22) taktmäßig von dem Gegendruckzylinder (25) abhebbar ist.

Die Erfindung bezieht sich auf eine Einrichtung zum ständigen Aufbringen von Puder auf einen Teil der Mantelfläche eines Gegendruckzylinders einer Bogendruckmaschine und zum Abgeben des Puders an die Rückseite des Druckbogens mit einer an einem außerhalb der Bogenführungsbahn für den Druckbogen gelegenen Umfangsbereich des Gegendruckzylinders angeordneten Puderauftragung.

Eine derartige Einrichtung ist aus der US-PS 11 60 892 bekannt. Sie dient dazu, in einer Druckmaschine für Schön- und Widerdruck nach dem Aufbringen des Widerdruckes auf einen kurz zuvor in einem anderen Druckwerk mit dem Schöndruck versehenen Druckbogen die von dem noch frischen Schöndruck auf die Mantelfläche des Gegendruckzylinders unvermeidlich abgegebene Farbe wieder zu entfernen, bevor der nächste Druckbogen zugeführt wird. Hierzu ist unmittelbar hinter der Auftragsvorrichtung für den Puder eine Bürst- und Absaugvorrichtung angeordnet, mit deren Hilfe die am Gegendruckzylinder anhaftende Farbe abgebürstet, mit dem aufgetragenen Puder vermengt und abgesaugt wird, um sicherzustellen, daß weder Farbe, noch Puder an dem Gegendruckzylinder haften bleibt.

Mit dieser bekannten Einrichtung kann somit nur ein sogenanntes Abschmieren, d. h. Abfärben des frischen Druckes auf den folgenden Druckbogen, innerhalb des Druckwerkes selbst verhindert werden. Es tritt aber sehr häufig auch der Fall auf, daß der Druck noch im

Auslegestapel abschmiert, was durch die bekannte Einrichtung nicht vermieden werden kann.

Um das Abschmieren im Auslegestapel zu verhindern, ist es üblich, über dem Auslegestapel eine gesteuerte Sprüheinrichtung anzuordnen, die Puder mit Hilfe von Druckluft auf die frisch bedruckte Seite des jeweils obersten Druckbogens steuert. Aus der US-PS 26 40 458 ist es auch bekannt, auf einem gesonderten Druckmaschinenzylinder Puder auf den frischen Druck aufzutragen. Beides hat jedoch den Nachteil, daß durch das unmittelbare Auftragen des mehligten Puders auf den frischen Druck dem Druckbild der Glanz der frischen Farbe genommen wird.

Der Erfindung liegt nun demgegenüber die Aufgabe zugrunde, eine Einrichtung zum Aufbringen von Puder auf einen Gegendruckzylinder der eingangs genannten Art zu schaffen, mit welcher ein Abschmieren im Auslegestapel vermieden werden kann, ohne daß das Aussehen des Druckbildes darunter leidet.

Diese Aufgabe wird erfindungsgemäß dadurch gelöst, daß der Teil der Mantelfläche des Gegendruckzylinders zur Aufnahme einer gleichmäßig haften bleibenden Puderschicht ausgebildet ist, auf welchen die nicht zu bedruckende Rückseite des Bogens zu liegen kommt.

Diese Einrichtung hat den Vorteil, daß der Puder nicht auf die frisch bedruckte Vorderseite des Druckbogens, sondern auf die unbedruckte oder ggf. in einem früheren Arbeitsgang bedruckte Rückseite des Druckbogens aufgebracht wird. Sie ermöglicht das Aufbringen einer fein dosierten Puderschicht, so daß in dem Auslegestapel weit weniger Puder auf den frisch bedruckten Bogenoberseiten abgesetzt wird. Diese Einrichtung hat den weiteren Vorteil, daß der Puder beim eigentlichen Druckvorgang gleichsam in die Rückseite der Druckbogen eingewalzt wird, so daß er dort auch während des Transportes der Druckbogen zum Auslegestapel sicher haften bleibt.

Weitere Ausgestaltungen der Erfindung ergeben sich aus den Unteransprüchen. Im folgenden wird die Erfindung anhand eines in der Zeichnung dargestellten Ausführungsbeispiels näher erläutert. Es zeigt

Fig. 1 eine Offset-Bogendruckmaschine in Reihenaufbau mit drei Druckwerken schematisch,

Fig. 2 das letzte Druckwerk schematisch in größerem Maßstab.

Die zu bedruckenden Bogen werden in bekannter Weise vom Stapel 1 über den Anlegetisch 2 mittels eines sogenannten Schwinggreifers 3 an die Anlegetrommel 4 übergeben, von welcher sie von den Greifern des Gegen-Druckzylinders 5 des Druckwerks I übernommen werden. Jedes Druckwerk weist in üblicher Weise außer dem Gegen-Druckzylinder 5 bzw. 25 einen Gummizylinder 6 bzw. 26 und einen Plattenzylinder 7 bzw. 27 auf, dem ein Farbwerk 8 bzw. 28 und ein Feuchtwerk 9 bzw. 29 zugeordnet sind. Die Druckwerke II und III sind untereinander durch eine 10 oder mehrere Überföhrtrommeln 11, 12, 13 miteinander verbunden. Nach dem letzten Druckwerk III übernimmt eine mit der Auslegetrommel 14 zusammenwirkende Greifereinrichtung an endlosen Auslegeketten 15 die Bogen zur Ablage auf den Stapel 16.

Um das direkte Einwirken des pulverförmigen Puders auf die frische Farbe am Auslegestapel zu verhindern, ist am letzten Druckwerk eine Auftragsvorrichtung 17 für die Aufbringung des Mittels auf die Bogenrückseite vorgesehen. Diese Vorrichtung 17 besteht aus einem den Puder enthaltenden Behälter 18, in welchem eine Duktoralze 19 umläuft, gegen die eine Auftragswalze

4

Es ist durchaus denkbar, daß auch an den Druckzylindern der dazwischenliegenden Druckwerke, wie bei 17' angedeutet ist, Vorrichtungen der beschriebenen Art zur Behandlung der Bogen vorgesehen sein können.

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Fig. 1

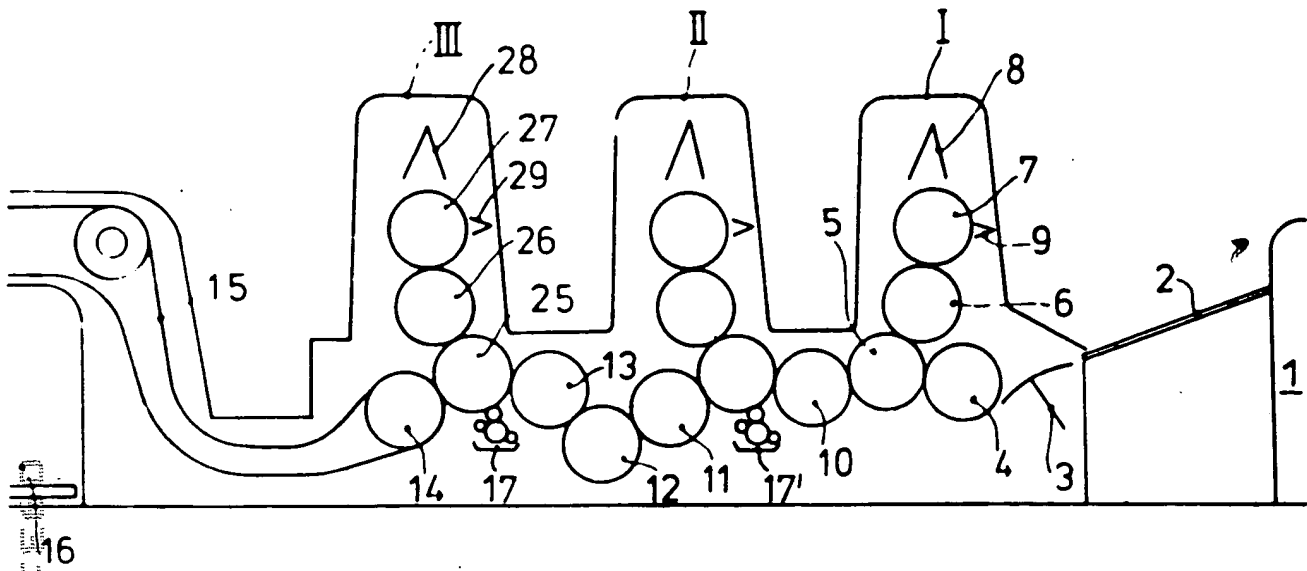
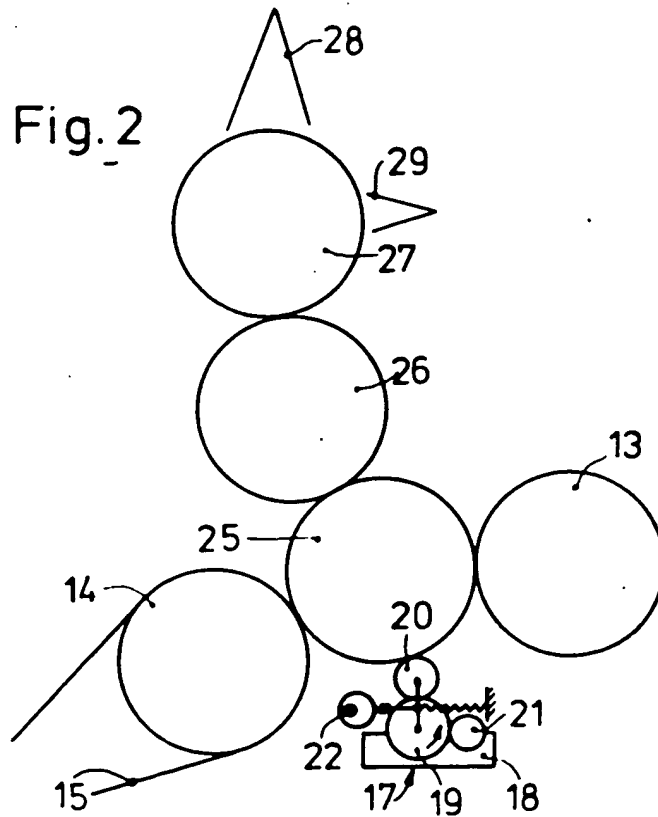


Fig. 2





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Slip sheet insertion-delivery apparatus for sheet-fed printing press.

In a slip sheet insertion-delivery apparatus, a plurality of printing sheet grippers opposite to some of a plurality of gripper pads mounted on a gripper pad shaft and slip sheet grippers opposite to the remaining gripper pads are mounted on one gripper shaft. The slip grippers are loosely fitted on the gripper shaft through corresponding torsion springs. A cam mechanism is arranged to simultaneously open/close the printing and slip sheet grippers near a cylinder. Another cam mechanism including a plurality of cams is arranged to simultaneously open/close only the slip sheet grippers at a slip sheet insertion position.

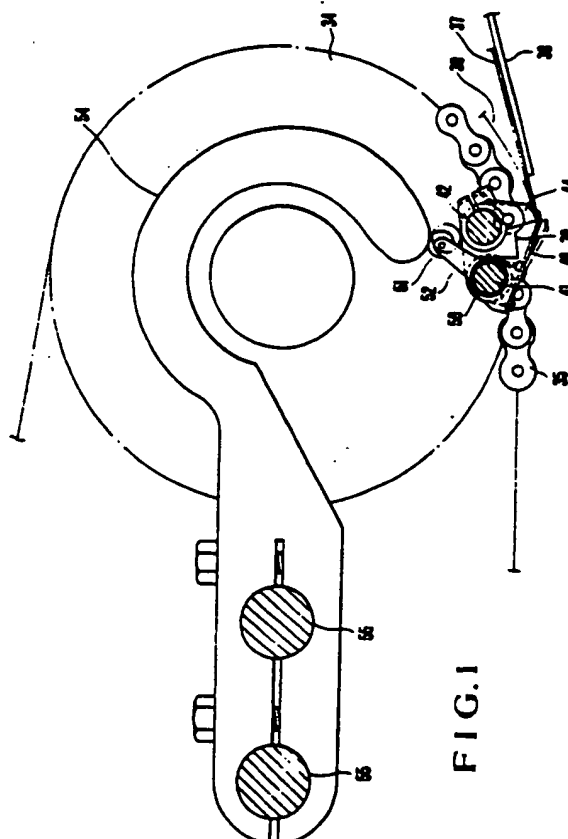


FIG. 1

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Slip Sheet Insertion-Delivery Apparatus For Sheet-fed Printing Press

Background of the Invention

The present invention relates to a slip sheet insertion-delivery apparatus for inserting and delivering a slip sheet between adjacent printing sheets in order to prevent offsetting when sheets are delivered and stacked in a sheet-fed printing press.

In a sheet-fed printing press, a sheet conveyed by a delivery chain after printing is released at a rear end of a convey path and is dropped and stacked on a stack board. However, an ink on a sheet immediately after printing is not yet dried, and if such sheets are stacked in this state, offsetting occurs. In order to prevent this, in a conventional printing press, powder is sprayed on a printed surface between a printing apparatus and a delivery apparatus or a printed surface is dried upon radiation of an infrared ray.

However, like in intaglio printing, a thickness of an ink film on a printed surface reaches several tens of microns, i.e., about ten times that in a lithographic printing press. In this case, even though a printed surface is forcibly dried by an infrared ray, drying is not sufficient. If powder is sprayed on a printed surface, quality of a printed product is degraded. Therefore, a slip sheet insertion-delivery apparatus which inserts a slip sheet between adjacent printing sheets when the sheets are delivered on a stack board has been conventionally used.

Figs. 6 and 7 show a conventional slip sheet insertion-delivery apparatus. In Figs. 6 and 7, a plurality of pairs of right and left gripper rod holders 2 are disposed at predetermined intervals between a pair of right and left delivery chains 1 which travel while circulating between a printing apparatus and a delivery apparatus. A gripper rod 6 consisting of a stationary gripper pad shaft 3, a pivotal printing sheet gripper shaft 4 and a pivotal slip sheet gripper shaft 5 is axially supported between each pair of right and left gripper rod holders 2. A plurality of gripper pads 7 are parallelly split-fixed on the gripper pad shaft 3. A plurality of printing sheet grippers 8 and slip sheet grippers 9 are parallelly split-fixed to the gripper shafts 4 and 5, respectively, to have different phases as those of the gripper pads 7. Cam levers 12 and 13 on which cam followers 10 and 11 are pivotally mounted on their free end portions, respectively, are axially mounted on the shaft end portions of the gripper shafts 4 and 5. Upon traveling of the delivery chains 1, the cam followers 10 and 11 face cams provided near a printing cylinder on the side of a

frame at a delivery position, so as to open the grippers at a predetermined timing.

With the above arrangement, when the delivery chains 1 travel and the cam follower 10 is in contact with the cam near the printing cylinder, only the printing sheet grippers 8 are opened and closed to regrip the printing sheet from the grippers of the printing cylinder. Then, the sheet is conveyed to be gripped by the printing sheet grippers 8 and the gripper pads 7. Upon regripping, since the slip sheet grippers 9 are kept closed, a sheet 14 is gripped by the printing sheet grippers 8 to cover the slip sheet grippers 9, as shown in Fig. 8. When the gripped edge of the sheet 14 conveyed in this manner has reached in front of the stack board, a slip sheet is fed onto a feeder board, and the cam follower 11 faces the corresponding cam, so that the slip sheet grippers 9 are opened and closed while causing the printing sheet 14 to leap up, and grip the slip sheet between themselves and the gripper pads 7. Thereafter, when the slip sheet has reached the stack board, the grippers 8 and 9 are simultaneously opened to deliver the printing sheet 14 and the slip sheet to overlap each other.

However, in the conventional slip sheet insertion-delivery apparatus, since each pair of the gripper rods 6 comprise the two gripper shafts 4 and 5 for the printing sheet and the slip sheet, the overall traveling mechanism including the gripper rod holders 2 is heavy, thus interfering with high-speed and smooth operation. As described above, the printing sheet 14 covers the slip sheet grippers 9, as shown in Fig. 8. When the slip sheet is gripped, the slip sheet grippers 9 must be opened while causing the printing sheet 14 to leap up, the printing sheet 14 is easily torn. In order to prevent this, a pitch indicated by p in Fig. 8 between the grippers 8 and 9 must be increased or a gripping margin of the slip sheet gripper indicated by t in Fig. 7 must be decreased. Therefore, paper sheets may be wasted due to misgripping. Thus, the operation is unstable, and adjustment is not easy.

Summary of the Invention

It is a principal object of the present invention to provide a slip sheet insertion-delivery apparatus for a sheet-fed printing press, which can realize a high-speed, smooth operation and allows easy adjustment.

It is another object of the present invention to provide a slip sheet insertion-delivery apparatus for a sheet-fed printing press, wherein a printing sheet

can be prevented from being torn by slip sheet grippers and hence a stable operation can be performed.

In order to achieve the above objects, there is provided a slip sheet insertion-delivery apparatus for a sheet-fed printing press, comprising a plurality of delivery gripper rods supported between right and left delivery chains at predetermined intervals and each consisting of a gripper shaft and a gripper pad shaft, a plurality of gripper pads arranged along each of the gripper pad shafts, a plurality of printing sheet grippers fixed on each of the gripper shafts at positions corresponding to some of the plurality of gripper pads, a plurality of slip sheet grippers loosely fitted on each of the gripper shafts through torsion springs at positions corresponding to the remaining gripper pads, a cam mechanism for reciprocally pivoting each of the gripper shafts through a predetermined angle at a regripping position from a cylinder so as to simultaneously open/close the printing sheet grippers and the slip sheet grippers and another cam mechanism comprising a plurality of cams with which cam followers of the slip sheet grippers are in contact, for opening/closing only the slip sheet grippers at a slip sheet insertion position.

Brief Description of the Drawings

Figs. 1 to 5 show a slip sheet insertion-delivery apparatus for a sheet-fed printing press according to an embodiment of the present invention, in which

Fig. 1 is a side view of a portion near a slip sheet insertion position of an intaglio printing press to which the present invention is applied,

Fig. 2 is a side view of a portion near grippers and gripper pads in an upper travel portion of a delivery chain,

Fig. 3 is a plan view of Fig. 2,

Fig. 4 is a schematic plan view of the overall apparatus, and

Fig. 5 is a schematic side view of an intaglio printing press to which the present invention is applied; and

Figs. 6 to 8 show a conventional slip sheet insertion-delivery apparatus in a sheet-fed printing press, in which

Fig. 6 is a schematic plan view of the apparatus,

Fig. 7 is an enlarged sectional view taken along a line A-A in Fig. 6, and

Fig. 8 is a schematic front view when viewed from a direction B in Fig. 6.

Description of the Preferred Embodiment

An embodiment of the present invention will be described with reference to Figs. 1 to 5.

As shown in Fig. 5, in a printing unit 20 of the printing press, a copperplate cylinder 21 having an outer surface on which a copperplate is mounted, and an impression cylinder 23 which comprises four arrays of a plurality of grippers 22 in gaps of the outer peripheral surface thereof are arranged so that their surfaces oppose each other. A form roller 25 of an inking apparatus 24 and a wiping roller 26 are in contact with the copperplate cylinder 21. A feedboard 28 comprising a front lay 27 at its front end portion is supported obliquely above the impression roller 23 through swing grippers 29.

With the above arrangement, a printing sheet 30 fed onto the feedboard 28 in a paper sheet feeder is vertically registered by the front lay 27, and is then gripped by the swing grippers 29. Then, the sheet 30 is regripped by the grippers 22 of the impression cylinder 23 and then passes between the impression cylinder 23 and the copperplate cylinder 21. In this case, an image is formed on the plate surface of the copperplate cylinder 21 by cooperation of the inking apparatus 24 and the wiping roller 26. The image is transferred onto the printing sheet 30 passing between the cylinders 23 and 21, thus performing printing.

A delivery cylinder 31 is in contact with the surface of the impression cylinder 23, and a pair of right and left delivery chains 35 are looped between a pair of right and left sprockets 32 coaxially provided on the delivery cylinder 31 and sprockets 34 of a delivery apparatus 33. A vertically movable stack board 36 is disposed in the delivery apparatus 33, and a distal end of a feedboard 38 on which a slip sheet 37 fed from the paper sheet feeder is slid and stopped is arranged adjacent to the end of the delivery chains 35. A plurality of substantially rectangular gripper rod holders 39 are fixed to the delivery chains 35 at predetermined intervals. A stationary gripper pad shaft 41 and a pivotal gripper shaft 42 constituting a gripper rod 40 are axially supported between the right and left gripper rod holders 39. Reference numerals 43 denote coupling plates which are located at a plurality of positions of each gripper rod 40 and are fixed to the gripper pad shaft 41. A hole formed on each coupling plate 43 pivotally supports the corresponding gripper shaft 42, thus regulating flexure of the gripper shaft 42. A plurality of gripper pads 44 are split-fixed onto the gripper pad shaft 41 at substantially predetermined intervals. A cam lever 46 having a cam follower 45 at its free end portion is axially mounted on the shaft end portion of the gripper shaft 42. A plurality of printing sheet grippers 47 and a plurality of slip sheet grippers 48

having substantially the same structure are alternately arranged on the gripper shaft 42 to face some gripper pads 44 and the remaining gripper pads 44, respectively. The printing sheet grippers 47 of the grippers 47 and 48 are fixed to the gripper shaft 42, and are pivoted integrally with the gripper shaft 42. Each slip sheet gripper 48 is pivotally fitted on the gripper shaft 42 and is biased by a pivoting force in a gripper closing direction as a counterclockwise direction in Fig. 2 by torsion coil springs 50 interposed between adjacent collars 49. Each slip sheet gripper 48 is integrally formed with a cam lever 52 on which a cam follower 51 is pivotally supported at its free end portion, and an inclination angle of the cam lever 52 indicated by 8 in Fig. 2 is formed to be substantially the same as that of the cam lever 46. Figs. 3 and 4 illustrate the cam lever 52 in detail. A single cam 53 having an arcuated cam surface which is almost concentric with the sprockets 32 and 34, and a plurality of cams 54 are disposed near the sprockets 32 as a regripping portion from the impression cylinder 23 and near the sprockets 34 corresponding to a slip sheet insertion position so that the cam follower 45 and a plurality of cam followers 51 face the corresponding cam surfaces. The cam 53 is fixed to the frame. However, the cams 54 are stationary supported on a stay 55 coupling the right and left frames. When the delivery chains 35 travel and the cam follower 45 is brought into contact with the cam surface of the cam 53, the gripper shaft 42 is pivoted to simultaneously open all the printing sheet grippers 47 and the slip sheet grippers 48. Thereafter, the grippers 47 and 48 are simultaneously closed. As a result, a printing sheet 30 is gripped by both the printing sheet grippers 47 and the slip sheet grippers 48. When the grippers 47 and 48 gripping the printing sheet 30 have reached the cams 54 and the cam followers 51 face the cam surfaces of the corresponding cams 54, the slip sheet grippers 48 are opened against the biasing force of the torsion coil springs 50, and thereafter, the slip sheet grippers 48 are closed to grip the slip sheet 37 on the feedboard 38. A delivery cam 56 is provided on the frame above the stack board 36 in correspondence with the cam follower 45. When the grippers 47 and 48 gripping the printing sheet 30 and the slip sheet 37 pass by the center of the stack board 36, the cam follower 45 is brought into contact with the cam surface of the delivery cam 56, and the printing sheet grippers 47 and the slip sheet grippers 48 are simultaneously opened and deliver the printing sheet 30 and the slip sheet 37 onto the stack board 36 to overlap each other.

A delivery operation of the printing press with the above arrangement will be described. The printing sheet 30 and the slip sheet 37 are fed onto

the feedboards 18 and 38 at predetermined timings to start a printing operation. As described above, the printing sheet subjected to intaglio printing is gripped by the grippers 22, and the gripped edge of the sheet reaches a contact point with the delivery cylinder 31. At this time, since the cam follower 45 is brought into contact with the cam surface of the cam 53, the printing sheet grippers 47 and the slip sheet grippers 48 are simultaneously opened and are then closed, and the grippers 22 are opened. Therefore, the printing sheet 30 is regripped by both the grippers 47 and 48. Upon traveling of the delivery chains 35, when the printing sheet 30 which is conveyed while being gripped by the grippers 47 and 48 has reached a slip sheet insertion position, all the cam followers 51 are in contact with the corresponding cam surfaces of the cams 54 at the same time, and the slip sheet grippers 48 are opened against the biasing force of the torsion coil springs 50. Thereafter, the cam followers 51 pass by the cam surfaces and the grippers 48 are closed. The slip sheet grippers 48 grip the slip sheet 37 on the feedboard 38. As a result, the printing sheet 30 and the slip sheet 37 are gripped by the grippers 47 and 48 while normally overlapping each other. The conveyed sheets 30 and 37 are released from the grippers 47 and 48 when the cam follower 45 is in contact with the cam surface of the delivery cam 56 to simultaneously open the grippers 47 and 48. Then, the sheets 30 and 37 are dropped and stacked on the stack board 36. More specifically, since the printing sheets 30 and the slip sheets 37 are alternately stacked on the stack board 36, no offsetting occurs. The grippers 47 and 48 releasing the sheets 30 and 37 are closed when the cam surface is ended, and are moved toward the printing unit.

In this manner, when the printing sheet 30 is regripped from the grippers 22 of the impression cylinder 23, the sheet 30 is gripped by both the grippers 47 and 48, and at the slip sheet insertion position, only the slip sheet grippers 48 are opened to grip the slip sheet 37. Therefore, when the slip sheet grippers 48 are opened, they do not cause the printing sheet 30 to leap up unlike in the conventional apparatus.

As can be understood from the above description, according to the present invention, in a slip sheet insertion-delivery apparatus for a sheet-fed printing press, a plurality of printing sheet grippers facing some of a plurality of gripper pads arranged along a gripper pad shaft and a plurality of slip sheet grippers facing the remaining gripper pads are arranged along a single gripper shaft. The printing sheet grippers are fixed to the gripper shaft, and the slip sheet grippers are loosely fitted on the gripper shaft through torsion coil springs. The printing sheet grippers and the slip sheet

grippers are simultaneously opened/closed by a cam mechanism arranged near a printing cylinder, and only the slip sheet grippers are opened/closed by another cam mechanism arranged at a slip sheet insertion position. Thus, a printing sheet released from the grippers of the printing cylinder are regripped and conveyed by both the printing sheet grippers and the slip sheet grippers, and at the slip sheet insertion position, only the slip sheet grippers are opened to grip a slip sheet. The slip sheet grippers can be prevented from tearing the printing sheet when they are opened. Therefore, a pitch between adjacent grippers can be decreased, and a gripping margin of the grippers can be increased. The number of wasted sheets due to misgripping can be decreased, and adjustment of a regripping timing can be facilitated like in a non-slip sheet version printing press. Since the printing sheet is gripped by both the printing sheet grippers and the slip sheet grippers over a long distance, an ideal number and arrangement of grippers like in a non-slip sheet version printing press need not be modified. Since the two gripper shafts in the conventional apparatus can be reduced to one, and other components can also be omitted accordingly. Therefore, the overall gripper rod can be light in weight. Thus, a high-speed, smooth operation can be allowed, thereby improving productivity. In addition, wear of delivery chains can be reduced, resulting in advantages in maintenance.

grippers are in contact, for opening/closing only said slip sheet grippers at a slip sheet insertion position.

Claims

A slip sheet insertion-delivery apparatus for a sheet-fed printing press, comprising:

a plurality of delivery gripper rods supported between right and left delivery chains at predetermined intervals and each consisting of a gripper shaft and a gripper pad shaft;

a plurality of gripper pads arranged along each of said gripper pad shafts;

a plurality of printing sheet grippers fixed on each of said gripper shafts at positions corresponding to some of said plurality of gripper pads;

a plurality of slip sheet grippers loosely fitted on each of said gripper shafts through torsion springs at positions corresponding to the remaining gripper pads;

a cam mechanism for reciprocally pivoting each of said gripper shafts through a predetermined angle at a regripping position from a cylinder so as to simultaneously open/close said printing sheet grippers and said slip sheet grippers; and

another cam mechanism comprising a plurality of cams with which cam followers of said slip sheet

FIG. 1

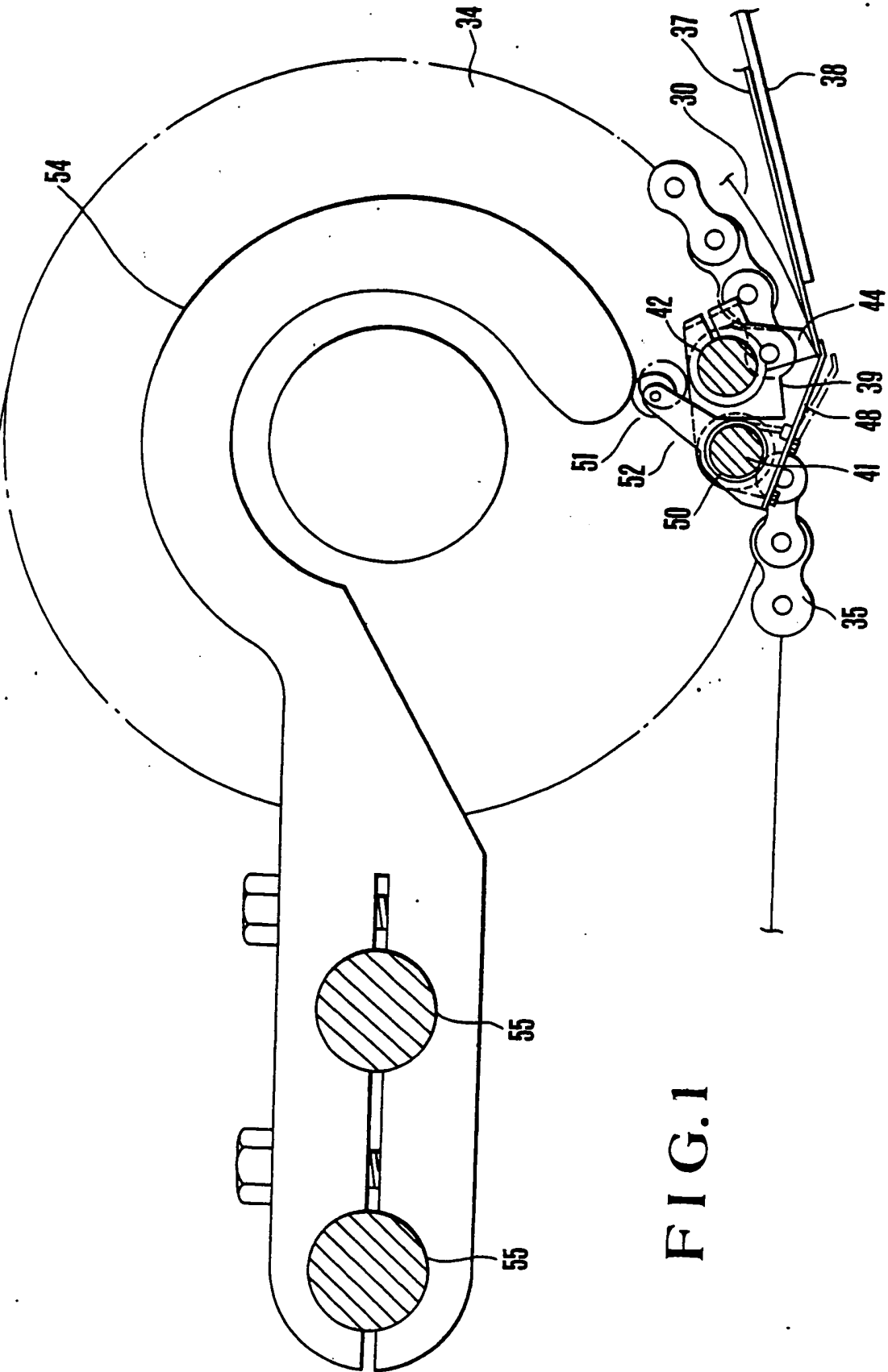


FIG. 1

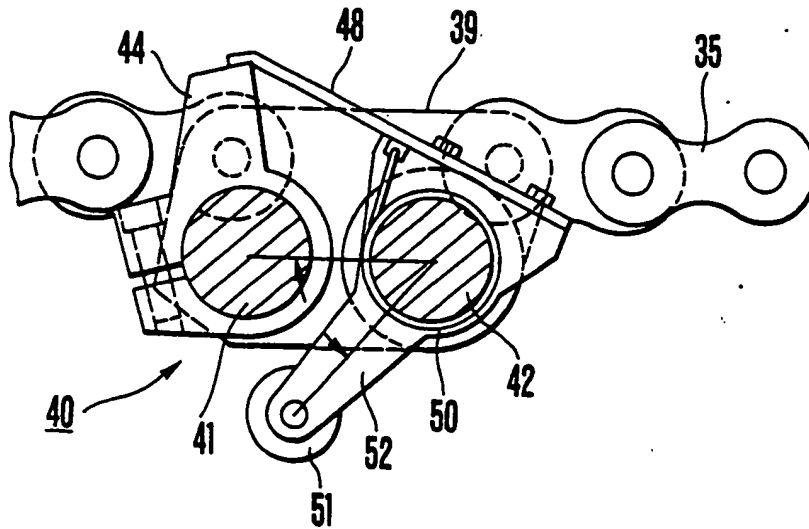


FIG. 2

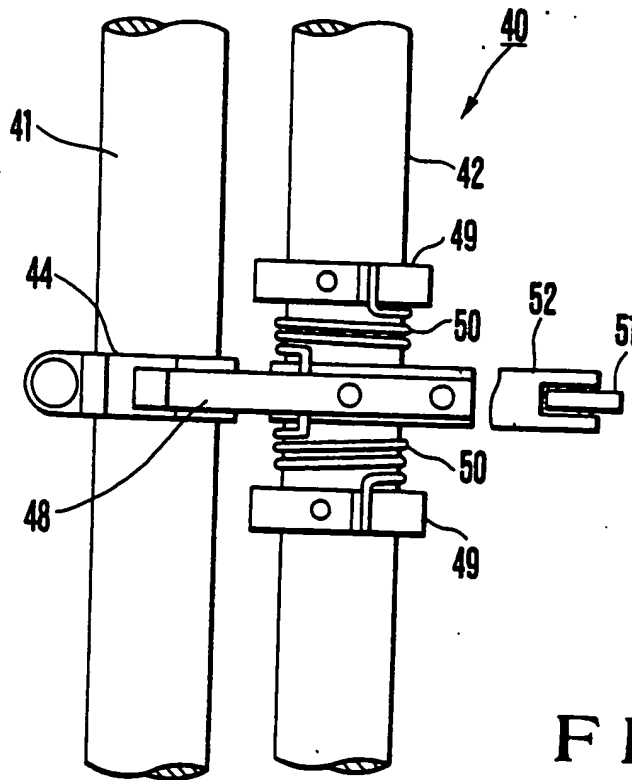


FIG. 3

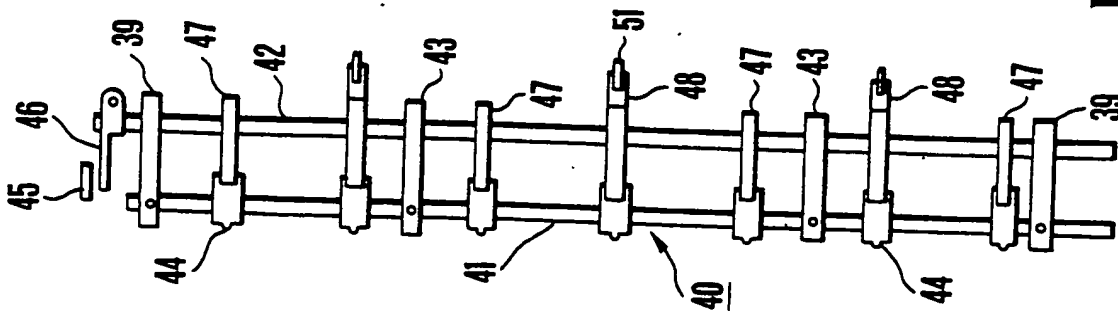


FIG. 4

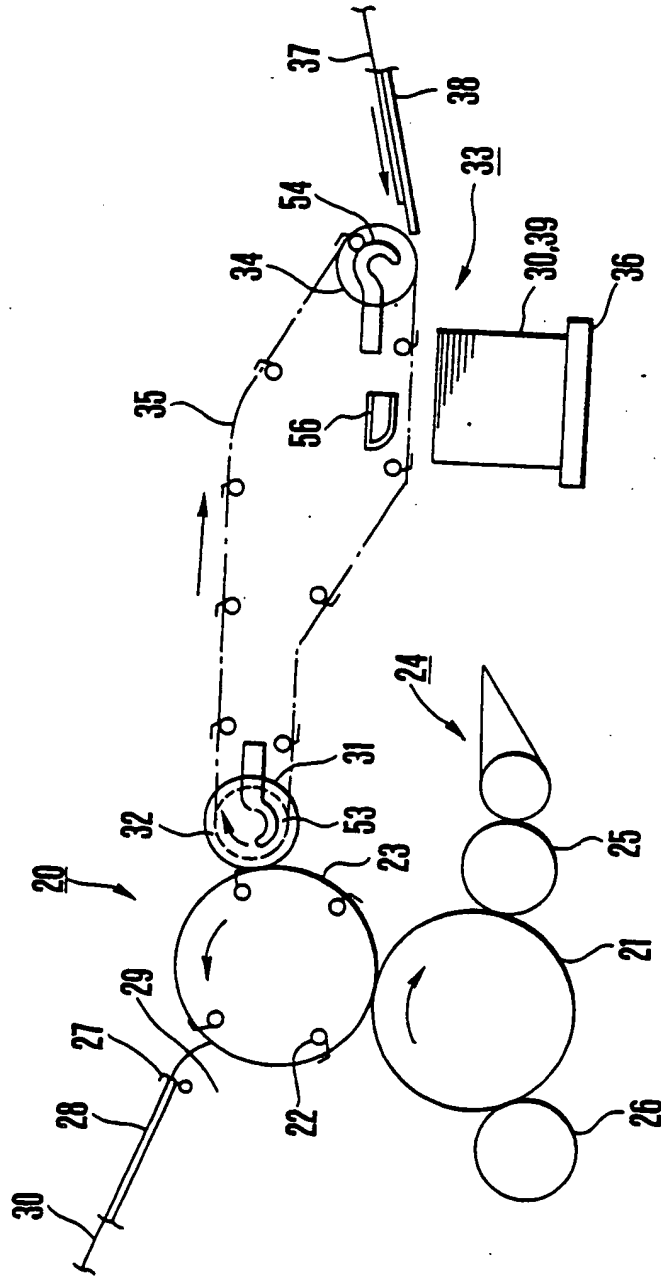


FIG. 5

FIG. 5

FIG. 6

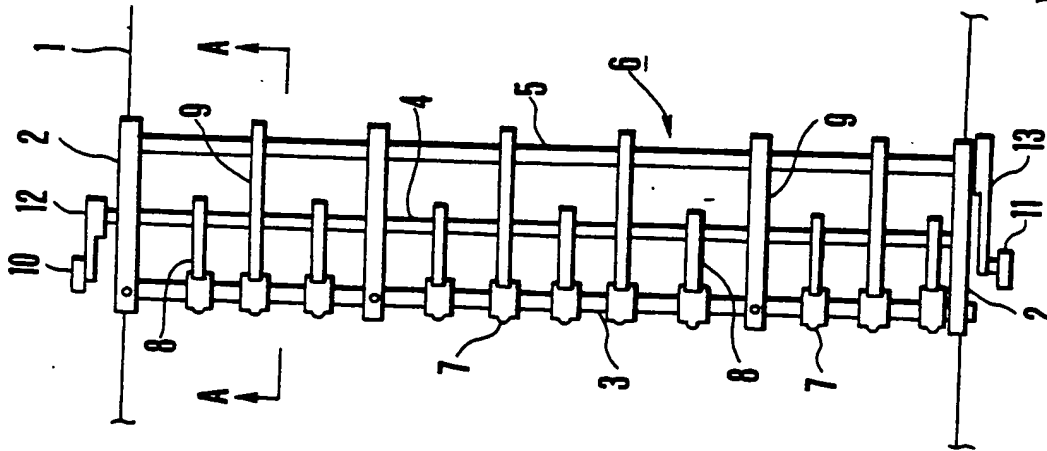


FIG. 6

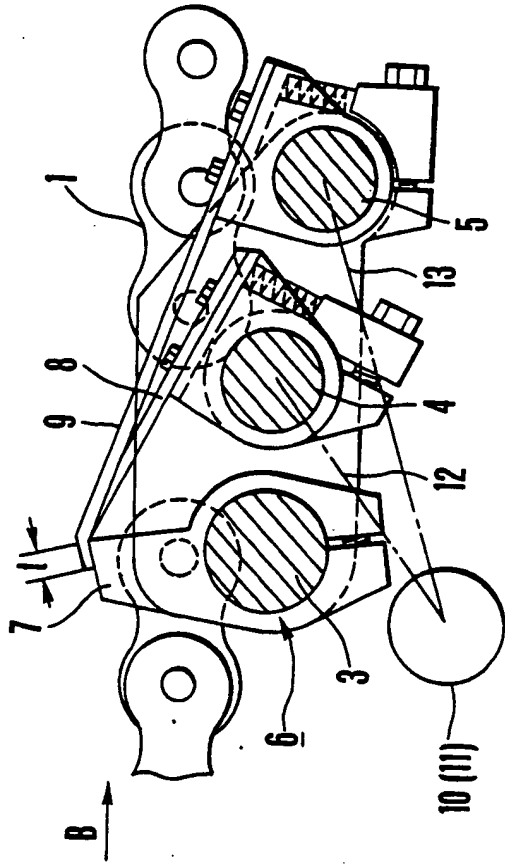


FIG. 7

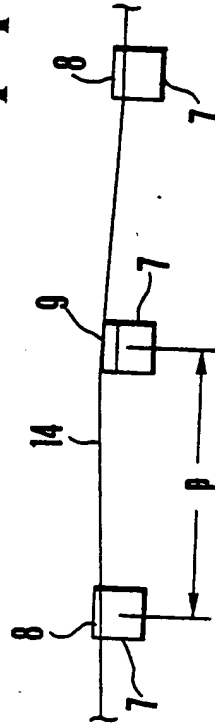


FIG. 8

⑨



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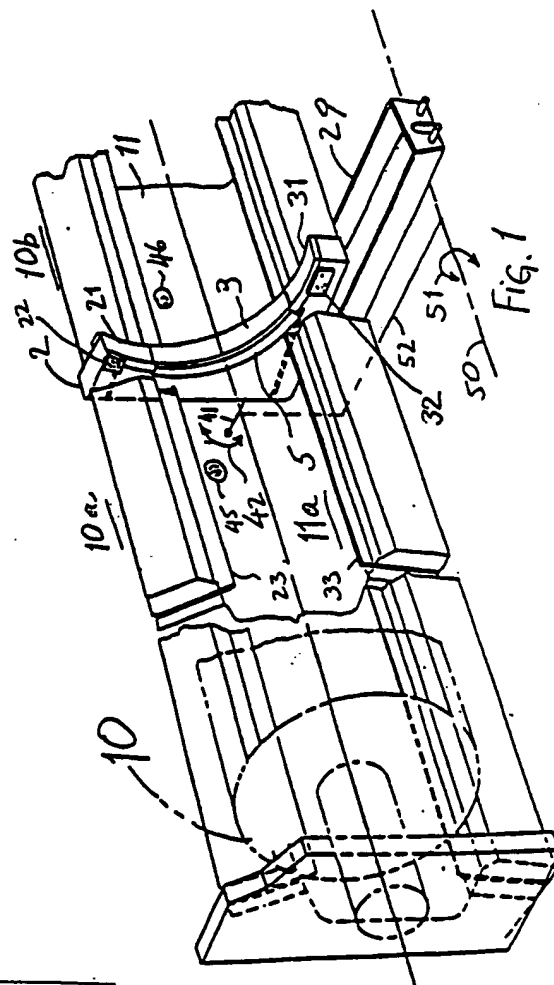
⑧④ Benannte Vertragsstaaten:
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⑤④ Geteilter Farbkasten für eine Flexodruckmaschine.

⑤⑦ Um einen Flexo-Farbkasten in axiale Zonen (10a, 10b, ...) unterteilen zu können, damit Druckfarben mit verschiedenen Eigenschaften, beispielsweise in verschiedenen Farben entlang der axialen Zonen einer Aniloxwalze (10) angewandt werden können, besitzt ein Trennelement (2) ein Einsatzstreifenelement (3), das sich über einen Teil des Umfangs der Aniloxwalze erstreckt und mit dieser, beispielsweise über zusammengedrückten Silikon- gummi (5), in elastischer Berührung steht. Angren- zend an die Enden des Streifenelements (5) befin- den sich zwei Filzkissen (21, 31), die einen ringförmigen Trennflüssigkeitsfilm auf die Aniloxwalze aufbrin- gen. An einer Trogstruktur sind zwei Rakeln ange- bracht, die abhängig von der Drehrichtung der Ani- loxwalze selektiv von ihrer Anlage an der Oberfläche der Aniloxwalze abgehoben werden können. Außer- dem können die Rakeln beide von der Oberfläche der Aniloxwalze abgehoben werden.



EP 0 293 586 A2

"GETEILTER FARBKASTEN FÜR EINE FLEXODRUCKMASCHINE"

Die vorliegende Erfindung bezieht sich auf Druckmaschinen, im besonderen auf Flexodruckmaschinen, und speziell auf ein Farbsystem oder einen Farbkasten für solche, wobei der Farbakasten axial in verschiedene Zonen unterteilt ist, um zu ermöglichen, in den betreffenden Zonen verschiedenfarbige Druckfarben für die entsprechenden Zonen einer Auftrag- oder Aniloxwalze zu verwenden.

Technologischer Hintergrund:

Flexodruckmaschinen werden auf dem Gebiet des Druckereiwesens in zunehmendem Maße benutzt. Üblicherweise verwendet man Flexodruckmaschinen zum Bedrucken von Beuteln, Verpackungsmaterialien, Kartonnagen und Schachteln. In neuerer Zeit wird der Flexodruck außerhalb des Verpackungsbereichs angewandt, hauptsächlich für Bücher, Zeitschriften, Geschäftsdrucksachen und dergleichen. Eine gute Besprechung des Flexodrucks findet man in "Maschinendruck" (Machine Printing) von Durrant, Meacock und Whitworth, Copyright 1973 bei Hastings House Publishers, New York, N.Y.

Es ist schon früher vorgeschlagen worden, Druckfarben mit verschiedenen Merkmalen, beispielsweise in verschiedenen Farben, hinsichtlich konkreter Zonen auf einer Farbduktorwalze zu trennen, an der mindestens eine oder üblicherweise zwei Rakeln angreifen, siehe z.B. die U.S.-Anmeldung, Seriennummer 921.338, eingereicht am 21. Oktober 1988, von Batke und anderen. Diese Anmeldung bezieht sich auf ein System, in dem unter einer sich axial erstreckenden Rakel eine Trennplatte angeordnet ist. Die Trennplatte besitzt, an dieser befestigt, ein Abdichtelement, das elastisch an der Unterseite zweier dem Duktors oder der Trogwalze aus verschiedenen Richtungen gegenüberstehenden Rakeln angreift, die den Betrieb des Duktors oder der Trogwalze in beiden Drehrichtungen ermöglichen. An der Kante, welche an den Rakeln anliegt, ist eine reibungsarme Oberfläche angebracht, wobei das abdichtende Element den Raum zwischen den Rakeln überbrückt und das Element mit dem Umfang des Duktors oder der Trogwalze zusammengepaßt ist. Die Rakeln erstrecken sich axial über die Abdichtelemente hinaus. Die Trennplatten und die Abdichtelemente können an Einheiten montiert werden, die effektiv entlang dem Farbkasten und somit entlang dem Duktors oder der Trogwalze angeordnet sind, und zwar in so gewählten Positionen, wie es die axiale Erstreckung der verschiedenfarbigen Druckfarben-

zonen erfordert.

Die deutsche Patent-Offenlegungsurkunde DE-OS 23 20 638, auf die in der vorerwähnten Patentanmeldung von Batke Bezug genommen wird, beschreibt eine Anordnung, bei der zwei die Druckfarben trennende Blechelemente durch eine Federkraft direkt an den Umfang eines Duktors angestellt werden, um verschiedenfarbige Druckfarben voneinander zu trennen. Die Querabdichtung des Druckfarbenbehälters oder Farbsumpfs wird hergestellt, indem man die Trennelemente gegen die gegenüberliegende Oberfläche der Rakeln oder Abstreifmesser anstellt.

Die Erfindung:

Sie hat zur Aufgabe, eine flexible Einrichtung zum Trennen axialer Zonen auf einer Aniloxwalze für eine Flexo-Druckmaschine zu schaffen, so daß Druckfarben mit verschiedenen Merkmalen, beispielsweise in verschiedenen Farben, ohne Überlappung auf die betreffenden Zonen aufgebracht werden können, wobei die Einrichtung einfach und kostengünstig ist und für eine wirksame Abdichtung der axialen Zonen gegeneinander sorgt.

Kurz gesagt, ein trennendes Streifenelement, vorzugsweise mit einer reibungsarmen Oberfläche, hat eine gekrümmte Fläche, die gegenüber der Oberfläche der Aniloxwalze angebracht ist und mit dieser zusammenpaßt. Die gekrümmte Fläche erstreckt sich über einen Teil des Walzenumfangs. Um die Druckfarben mit verschiedenen Eigenschaften eindeutig zu trennen und so eine Wanderung der Farbe zwischen den beiden oder mehreren Druckfarbazonen zu verhindern und den Abriebeffekt der auf Wasserbasis hergestellten Druckfarben zu eliminieren, wird zwischen das Streifenelement und die Oberfläche der Aniloxwalze ein dünner Film einer wässrigen Flüssigkeit eingebracht. Typisch ist das Streifenelement aus Teflon hergestellt, und die Flüssigkeit ist Wasser. Andere Flüssigkeiten, wie Wasser-Alkoholgemische oder Druckfarben-Lösungsmittel können benutzt werden. Der Flüssigkeitsfilm wird in den Bereich unter dem Streifen so eingebracht, daß zwei mit Flüssigkeit tränkbare Elemente neben den Enden des Streifenelements angebracht werden. Ein bevorzugtes Material ist Filz; andere schwammartige Werkstoffe können benutzt werden. Die Flüssigkeit wird den Filzelementen zugeführt, die als Döchte wirken und den dünnen Flüssigkeitsfilm genau in den Bereich des Trennstreifens einbringen.

In Übereinstimmung mit einer vorteilhaften Ausgestaltung der Erfindung ist das Streifenele-

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ment rückseitig mit beispielsweise Silikongummi mit einem niedrigen Durometerwert hinterfütert. Das ermöglicht der Dichtung, sich unabhängig von der Drehrichtung der Aniloxwalze selbsttätig einzustellen.

Aniloxwalzen werden üblicherweise mit Rakeln benutzt. Gemäß einer weiteren vorteilhafter Ausgestaltung der dem Erfindung werden die Rakeln beschnitten oder so ausgeführt, daß sie an den Trennelementen enden. Die Gummihinterfüterung ermöglicht das Abdichten der Rakelecken in den Druckfarbenkammern neben den Farben-Trennelementen und somit auch das wirkungsvolle Abdichten der Rakelekanten, und zwar durch das plastische Verformen des Silikongummis, d.h. durch das Vorwölben über die Kante bei Druckanwendung.

In Übereinstimmung mit einer weiteren vorteilhaften Ausgestaltung der Erfindung ist das Farbsystem so angeordnet, daß eine Haltestruktur für die Trennenden Streifenelemente, für die Gummihinterfüterung und für die Filzkissen oder, vorzugsweise, der ganze Farbkasten so bewegt werden können, daß wahlweise eine der beiden Rakeln mit der Aniloxwalze in Berührung steht, und zwar abhängig von der Drehrichtung der Aniloxwalze, und daß ferner die Bewegung so erfolgen kann, daß beide Rakeln die Aniloxwalze freigeben, während das Trennelement und, vorzugsweise, auch die Kissen mit der Oberfläche der Aniloxwalze in Berührung bleiben. Das hat den Vorteil, daß während der Perioden, in denen nicht gedruckt wird, die Aniloxwalze weiter rotieren kann, wobei die Farbe im Farbkasten umgewälzt und dadurch einem Antrocknen der Farbe an der Aniloxwalze vorgebeugt wird, jedoch ohne daß eine der Rakeln mit der Aniloxwalze in Berührung steht, wodurch die Abnutzung sowohl der Aniloxwalze als auch der betreffenden Rakel oder Rakeln wesentlich herabgesetzt wird.

ZEICHNUNGEN:

Abb. 1 ist eine perspektivische Gesamtansicht eines Flexo-Farbwerks (wobei die Aniloxwalze als Phantombild angedeutet ist), das Farbwerk ist gemäß der vorliegenden Erfindung axial aufgeteilt.

Abb. 2 ist ein schematischer Schnitt senkrecht zur Achse einer Aniloxwalze, in dem die Druckfarben-Trenneinrichtung gemäß der vorliegenden Erfindung dargestellt ist.

Eine Aniloxwalze 10 in Standardausführung mit beispielsweise etwa 28 cm (ungefähr 11") Durchmesser ist in axiale Zonen unterteilt, entsprechend den axialen Zonen 10a, 10b oder mehr, je nach den Erfordernissen des Farbkastens. Ein Trennelement 2, beispielsweise aus Kunststoff - wofür Nylon geeignet ist - ist in einem geeigneten Bauteil des Farbkastens, der nur schematisch durch 11

dargestellt ist, mit Schrauben 12 befestigt. Der Farbkasten 11, der einen Farbenhohlraum 11a definiert, ist in bekannter Weise am Maschinenrahmen befestigt. Er kann um eine zur Ebene der Abb. 2 senkrechte Achse 11b (Abb. 2) etwas pendeln. Das Trennelement ist schmal, und es erstreckt sich über einen Teil des Umfangs der Aniloxwalze 10. Das Trennelement 2 ist mit einer Ausnehmung 13 ausgeführt, in die eine Teflondichtung 3 eingesetzt ist, die rückseitig durch eine Hinterfüterung 5 aus Silikongummi gestützt wird. Bei Zeitungsdruck ist eine Breite der Elemente 3 und 5 von etwa 15 mm geeignet.

Das Silikongummi-Hinterfüterungselement 5 verteilt den Druck des Nylon-Trennstreifens 3 gleichmäßig über den Umfang der Aniloxwalze. Die zusammendrückende Kraft im Silikongummi kann durch Gegendrücken gegen die Aniloxwalze 10 erzeugt werden. Damit kann der Druck des Trennstreifens 3 gegen die Aniloxwalze gesteuert werden.

Erfindungsgemäß wird ein dünner Flüssigkeitsfilm - typisch ist Wasser - zwischen die Aniloxwalze 10 und den Teflon-Trennstreifen 3 gebracht. Dieser dünne Wasserfilm kommt von zwei Filzkissen 21, 31, die mit Wasser aus einem Wasserversorgungs-Leitungsnetz beliefert werden. Das Leitungssystem für die Wasserversorgung wird durch die Hohlschrauben 14a, 14b gebildet, die in das Trennelement eingeschraubt sind und mit Kanälen 15a, 15b in Verbindung stehen, die in dem Trennelement ausgebildet sind und an den Filzstreifen 21 bzw. 31 enden. Die Formen der Kanäle können jedem zweckdienlichen Erfordernis angepaßt werden, beispielsweise gerade, wie bei 15a dargestellt ist, oder abgewinkelt oder gekrümmt, wie bei 15b. Ein Wassertrog 29 unter der gesamten Anordnung nimmt einen eventuellen Wasserüberschuß oder das Tropfwasser auf.

Die Schrauben 14a, 14b haben Außengewinde, und man kann, obwohl das nicht erforderlich ist, Muttern 16a, 16b benutzen, um die Schrauben gegen den Rahmen 11 zu sichern. Die Schrauben 14a, 14b sind mittels einer geeigneten Flüssigkeitsverschraubung 17a, 17b an eine schematisch dargestellte Druckwasser-Zuleitung angeschlossen, die solche allgemein übliche hydraulische Bauteile, wie Kniestücke, Überwurfmutter und ähnl. sowie die Ventile 18a, 18b enthält. Das Wasser kann selektiv zu den jeweiligen Filzstreifen 21, 31 geleitet werden. Die Filzstreifen 21, 31 werden auf dem Trennelement 2 mit Hilfe der Halteplatten 22, 32, die die Filzstreifen 21, 31 von beiden Seiten umfassen, in ihrer Lage gehalten; in der Abb. 2 ist nur eine der Halteplatten 22, 32 sichtbar.

Die Rakeln 23, 33 stehen selektiv mit der Oberfläche der Aniloxwalze in Berührung, und sie verlaufen axial, d.i. senkrecht zur Zeichenebene der

Abb.2. Sie sind am Farbkasten befestigt. Um das selektive Anstellen der Rakeln 23, 33 in Abhängigkeit von der Walzendrehrichtung zu ermöglichen, kann der Farbkasten um den Gelenkzapfen 11b pendeln. Die Rakeln können axial in die Silikongummi-Hinterfütterung 5 eingedrückt sein, die sich leicht zusammendrücken läßt und sich um die Rakel vorwölbt, wie das schematisch bei 23, 24 gezeigt wird, wodurch eine gute Abdichtung gegen diese erzielt wird. Der Teflonstreifen 3 wird vorzugsweise mit scharfen Ecken ausgeführt.

Der Teflonstreifen 3 und die Silikon-Hinterfütterung 5 können in die Ausnehmung 13 eingesetzt werden, indem man sie, beispielsweise mit einem Kontakt-Kleber, darin einklebt.

Der Wasserkanal durch die Schrauben 14a, 14b und die Verbindungskanäle 15a, 15b durch das Trennelement 2 können ganz eng sein, beispielsweise etwa zwei bis drei Millimeter im Durchmesser, gerade genug, um Wasser auf die Filzkissen 21, 31 zu träufeln, so daß sich unter dem Teflonstreifen 3 ein Flüssigkeitsfilm ausbilden kann, der die benachbarten Zonen 10a, 10b ... und die entsprechenden Zonen auf der Aniloxwalze voneinander trennt. Die Bogenlänge der Filzstreifen kann bei einer Walze von etwa 28 cm Durchmesser ungefähr 7 bis 8 cm betragen.

Das Einbringen eines dünnen Wasserfilms zwischen den Teflonstreifen 3 und die Oberfläche der Aniloxwalze 10 hat den Vorteil, daß der Trennstreifen nicht die Aniloxwalze beschädigen kann, und daß eine Dichtung mit einer verlängerten Lebensdauer erzielt wird, die überdies nicht von der hohen Drehzahl der Aniloxwalze 10 beeinträchtigt wird. Die Verwendung von Wasser als Filmflüssigkeit hat einen zusätzlichen Vorteil, weil es das Austrocknen der flexographischen Druckfarbe auf der Aniloxwalze im Bereich der Druckfarbentrennebene verhindert und somit die schmirgelnden Eigenschaften der Druckfarben auf Wasserbasis eliminiert, die anderweitig den Verschleiß des Dichtungswerkstoffes durch das Ansetzen trockener Druckfarbe auf der Aniloxwalze verursachen würde.

Die Größe und Richtung des anzuwendenden Wasserstroms können leicht durch Bedienen des Dreiwegeventils 18 im Wasserzuleitungssystem zu den Kanälen 15a, 15b gesteuert werden. Die Menge kann leicht durch den Versuch ermittelt werden; es sollte gerade so viel Wasser benutzt werden, daß der Farbentrennbereich nicht austrocknet oder auf der Aniloxwalze hart wird. Neben der Wechselwirkung des Wasserfilms mit der Druckfarbe wirkt das Wasser noch zusätzlich als ein Schmiermittel, und es bildet einen Flüssigkeitsfilm auf dem Umfang der Aniloxwalze aus. Folglich schwimmt der Teflonstreifen 3 auf dem Film, und selbst wenn der Anpreßdruck beträchtlich ist, stellt sich ein Effekt ein, der dem Aquaplaning rollender Autoreifen auf

einer nassen Straßenoberfläche ähnelt. Dieser Flüssigkeitsfilm beseitigt wirksam die Reibung und verlängert die Lebensdauer der Dichtung. Genau wie beim Aquaplaning der Autoreifen auf der Fahrbahn ist die Reibung sehr gering.

Die Farbwanderung quer durch die Trennebene wird wirksam unterbunden, weil der Flüssigkeitsfilm der Flüssigkeit das Verbleiben nur zwischen der Aniloxwalze und der Teflondichtung gestattet und andererseits das Eindringen von Druckfarbe zwischen die Teflondichtung und die Aniloxwalze verhindert. Somit wird die Wanderung von Druckfarbe mit einer bestimmten Eigenschaft, beispielsweise einer bestimmten Farbe, in die Druckfarbe mit einer anderen Eigenschaft, beispielsweise einer anderen Farbe, wirksam verhindert.

Die Benutzung einer eigenen Gummi-Hinterfütterung 5 ist nicht unbedingt notwendig, aber vorzuziehen. Sie kann leicht erneuert werden und sorgt für einen gleichmäßigen Dichtungsdruck. Ein Silikongummi mit geringer Härte, beispielsweise ein geschlossenzelliger Silikongummi mit dem Härtegrad (Durometer) 30, hinter dem Teflondichtstreifen angeordnet, sorgt für eine gleichbleibende, gleichmäßige Dichtpressung gegen die Fläche der Aniloxwalze. Der Silikongummi mit geringer Härte zwischen der Wand des Trennelements 2 und der Teflondichtung sorgt auch für eine wirksame Abdichtung an den Ecken der Rakeln. Diese Silikongummiart erlaubt eine Komprimierung um etwa 20 %, was die Ursache für die leichte Ausdehnung 24, 25 des Silikongummis um die Rakelenden und Rakelecken ist.

Für die Herstellung der den Wasserfilm erzeugenden Elemente 21, 31 können verschiedene Werkstoffe verwendet werden; Filz ist besonders geeignet, weil er ein dosiertes Aufträufeln oder Auftragen des Wassers unter den Trennstreifen 3 ermöglicht. Das Wasser kommt mit den oberhalb und unterhalb der Teflondichtung angeordneten Filzkissen 21, 31 in Berührung. Die Dichte des Filzes ist solcherart, daß eine gleichmäßige Verteilung des Wassers erreicht wird. Das Wasser sickert infolge der Schwerkraft in den unteren Teil der Filzkissen.

Diese Anordnung hat den zusätzlichen Vorteil, billig zu sein. Teflon ist wesentlich teurer als Silikongummi oder Filz, und durch die Verwendung eines dünnen, kleinen Teflonstreifens mit rückseitiger Hinterfütterung mit Silikongummi und mit Filzkissen zu beiden Seiten verringert sich die benötigte Teflonmenge. Das Teflon wird nur in den Bereichen des Farbkastens zwischen der oberen und der unteren Rakel gebraucht.

Gemäß einer vorteilhaften Ausgestaltung der Erfindung kann der ganze Farbkasten 11 zusammen mit dem Trennelement 2, dem Streifenelement 3, mit dessen Hinterfütterungselement 5 und

mit den Rakeln 23, 33 um den Zapfen 11b pendeln. Der Kasten 11 wird am Maschinenrahmen von der Konsole 40 gehalten, die mit einer Haltestange 41 gekuppelt ist, die um den Gelenkzapfen 11b pendeln kann, wie das durch den Pfeil 42 in Abb. 2 schematisch dargestellt ist. Die Haltestange 41 ist abgebrochen dargestellt, weil der Gelenkzapfen 11b - bezogen auf die Abb. 2 - in der Regel weiter links liegt, und er auf der Zeichnung normalerweise nicht sichtbar sein würde, weil er beispielsweise hinter dem Ventil 18 versteckt wäre. Die Lage in der Abb. 2 ist nur aus Gründen der klaren Darstellung gewählt worden. Der Farbkasten 11 ist üblicherweise trogförmig, um den Hohlraum 11a für die Druckfarbe zu bilden. Die Druckfarbe wird kontinuierlich durch Eintrittsöffnungen 45 in den Farbhohlraum 11a eingeleitet und an den Austrittsöffnungen 46 abgelassen, wobei die Druckfarbe im Farbhohlraum ständig in Umlauf gehalten wird. Die Aniloxwalze 10, welche die Rakeln 23, 33 berührt oder in einem ganz kleinen Abstand von ihnen steht, verhindert den Verlust von Druckfarbe.

Gemäß einer weiteren vorteilhaften Ausgestaltung der Erfindung kann der Farbkasten 11 in Bezug auf die Aniloxwalze 10 wegbewegt werden, so daß die beiden Rakeln 23, 33 den Kontakt mit der Aniloxwalze 10 verlieren. Die Bewegung ist ganz gering, ein Bruchteil von einem Millimeter. Dadurch wird die ständige Umwälzung der Flexodruckfarbe im Farbtrog 11a sowie die Rotation der Aniloxwalze 10 mit niedriger oder mit Leerlaufdrehzahl ermöglicht, wodurch das Antrocknen der Farbe an der Walze 10 während der Zeiten, in denen nicht gedruckt wird, vermieden und dabei die Trennung der verschiedenen Druckfarben, beispielsweise in den verschiedenen Zonen 10a, 10b, aufrechterhalten wird. Das Streifenelement 3 sowie die Kissen 21, 31 dehnen sich etwas aus - nachdem sie vorher zusammengedrückt gewesen waren - aber nicht so sehr, daß sie den Kontakt mit der Aniloxwalze verlieren würden. Wenn eines der Kissen 21, 31 oder beide Kissen über einem Teil des Umfangs den Kontakt verlieren sollten, so kann das wenig Schaden anrichten. Es wird genügend Wasser nachgeliefert, um einen ringförmigen Flüssigkeitsfilm entlang dem Streifen 3 auf der Aniloxwalze 10 zu bilden, so daß der Streifen 3 auf dem ringförmigen Film schwimmen oder gleiten und dadurch dauernd verhindern kann, daß die Farben aus den Zonen 10a, 10b sich vermengen oder ineinander verlaufen, während die Aniloxwalze sich immer noch weiterdrehen darf, wobei sie vor dem Farbhohlraum 11a verbleibt. Die Bewegung des Farbtroges in der Weise, daß die Rakeln 23, 33 von der Walze 10 freikommen, d.h. gerade eben freikommen, wobei es dem Hinterfütterungsgummi 5 sowie auch den Kissen 21, 31 möglich ist, sich auszudehnen, kann auf jede geeignete Art und Weise er-

reicht werden. Wie in der Abb. 1 dargestellt ist, verläuft die gemeinsame Achse 50 längsseits des Farbwerks, parallel zum Farbtrog 11. Sie kann pendeln, wie durch den Pfeil 51 angedeutet wird. Die Achse 50 ist mit Hilfe eines Winkelhebels 52 mit der Tragstange 41 bzw. der Konsole 40 der Kippvorrichtung des Trennelements 2 gekoppelt.

10 Wirkungsweise:

Wenn die Aniloxwalze 10 im Uhrzeigersinn, in Vorwärtsdrehung, läuft, sollte das obere Kissen entfernt und das obere Tropfsystem abgestellt werden, indem man z.B. das Ventil 18 so stellt, daß das Wasser zum unteren Kissen 31 geleitet wird. Das untere Kissen 31 verbleibt an seinem Platz, und das untere Tropf- oder Wasserauftragsystem wird durch das Ventil 18 in Betrieb gesetzt, und durch diese Aktion trägt das Kissen 31 einen dünnen Wasserfilm auf die Walze 10 auf, der es dem Streifen 3 ermöglicht, auf dem Film zu schwimmen. Nach dem Anlaufen der Walze 10 bildet sich auf der Walze 10 ein Wasserring aus, der die benachbarten Druckfarbenzonen voneinander trennt. Der Farbkasten 11 wird um die Achse 11b geschwenkt, siehe Pfeil 42, um die Rakel 23 außer Eingriff zu bringen. Die Gummi-Hinterfütterung 5 vergleichmäßig den Berührungsdruck des Streifens 3 gegen die Walze 10. Nach dem Umsteuern der Drehrichtung der Aniloxwalze 10 in die Richtung entgegen dem Uhrzeiger kann das untere Tropfsystem durch Verändern der Stellung des Ventils 18 abgestellt und das untere Filzkissen 31 entfernt werden. Das obere Filzkissen 21 bleibt an seinem Platz, und das obere Tropfsystem wird eingeschaltet. Das nicht benetzte Kissen sollte entfernt werden, damit es nicht austrocknet. Das Entfernen des Filzkissens ist einfach, man braucht es nur herauszuziehen, auch kann man die Befestigungsschrauben lösen, die die betreffende Klemmplatte 22, 32 halten, und dann die jeweiligen Filzstreifen 21, 31 herausnehmen.

Unter normalen Druckbedingungen kann die Walze 10 z.B. mit Drehzahlen von mehr als 800 U/min laufen. Wenn die Maschine nicht druckt, war es üblich, den Farbenzufluß abzustellen und einen "Reinigungsvorgang" einzuschalten, um das Antrocknen der sich schnell verflüchtigenden Farbe auf der Aniloxwalze 10 und im Farbkasten zu verhindern. Gemäß dem Merkmal der vorliegenden Erfindung kann jedoch die Walze 10 im Leerlauf weiterlaufen gelassen werden, z.B. bei 30 U/min, wobei die Farbe kontinuierlich zwischen den Eintrittsöffnungen 45 und den Austrittsöffnungen 46 - in Abb. 1 nur in verschiedenen Farbzonen dargestellt - umgewälzt wird, während die Farbzonen voneinander getrennt bleiben. Nach dem Kippen

der Welle 50 entgegen dem Uhrzeigersinn des Pfeils 51 kommen beide Rakeln 23 und 33 außer Eingriff mit der Aniloxwalze 10. Die Kippachse der Welle 50 ist vorzugsweise im wesentlichen vertikal mit der Drehachse der Aniloxwalze 10 ausgerichtet, und, beispielsweise, etwas unterhalb des Farbtrogs 29. Die normale Zusammenpressung des Gummi-Hinterfütterungselements 5 kann beim Drucken etwa 20 % seiner ungespannten Nenndicke betragen, die der Filzkissen etwa 10 %. Ein leichtes Ankippen des Farbkastens 11 erlaubt eine gewisse Entspannung der Gummi-Hinterfütterung 5 und der Filzkissen 21, 31, jedoch ohne daß diese ihrer Funktion verlustig gehen würden. Auf diese Weise kann der Reinigungsvorgang während der Leerlaufperioden eliminiert werden. Die Streifenelemente 3 und die Kissen 21, 31 bleiben mit der Walze 10 in Berührung, und sie trennen so die Farbzonen, wobei sie die Kanten der Rakeln 23, 33 und die Oberfläche der Aniloxwalze schützen.

Innerhalb des Umfangs des Erfindungskonzepts können vielfältige Änderungen und Modifikationen vorgenommen werden.

Ansprüche

1. In einer Flexodruckmaschine eine Anordnung zum Aufteilen eines Farbkastens (11) in verschiedene axiale Zonen (10a, 10b), um die Verwendung von Druckfarben mit jeweils unterschiedlichen Eigenschaften in verschiedenen Zonen einer Aniloxwalze (10) zu ermöglichen, erfindungsgemäß beinhaltend ein trennendes Streifenelement (3) mit einer gekrümmten Oberfläche, das an der Oberfläche der Aniloxwalze (10) anliegt und mit dieser zusammenpaßt, und das sich über einen Teil des Umfangs derselben erstreckt; sowie Mittel (21, 14a, 15a; 31, 14b, 15b; 18) zum Einbringen eines hydraulischen Films einer Trennflüssigkeit zwischen die Oberfläche des Streifenelements (3) und die Oberfläche der Aniloxwalze (10) als Flüssigkeitsring im wesentlichen nur in jener Umfangsregion der Aniloxwalze, die den besagten Teil deren Umfang einschließt.
2. Die Anordnung nach Anspruch 1, in welcher die besagte Flüssigkeit Wasser enthält.
3. Die Anordnung nach Anspruch 1, in welcher die besagten Mittel zum Einbringen eines hydraulischen Films der Trennflüssigkeit ein Kissenelement (21, 31) aus einer porösen Substanz beinhalten, das fluchtend mit dem besagten Trennstreifenelement (3) angeordnet ist; und Mittel einer Flüssigkeits-Versorgungsleitung (14a, 15a; 14b, 15b) in Flüssigkeitsverbindung mit dem besagten Kissenelement (21, 31) aus einer porösen Substanz.

4. Eine Anordnung nach Anspruch 3, in welcher zwei Kissenelemente (21, 31) und zwei Mittel für eine Flüssigkeits-Versorgungsleitung vorgesehen sind, wobei die jeweiligen Kissenelemente angrenzend an die äußersten Enden des besagten Trennstreifenelements (3) angeordnet sind.

5. Eine Anordnung nach Anspruch 3, in welcher die besagten Kissenelemente aus einer porösen Substanz Filzkissen einschließen.

6. Eine Anordnung nach Anspruch 1, weiterhin beinhaltend ein Hinterfütterungselement (5), das angrenzend an das Trennstreifenelement (3) an dessen von der besagten Aniloxwalze (10) abgewandten Seite angeordnet ist, wobei das besagte Hinterfütterungselement ein zusammendrückbares Material einschließt.

7. Eine Anordnung nach Anspruch 6, in welcher das besagte zusammendrückbare Material Silikongummi einschließt.

8. Eine Anordnung nach Anspruch 6, weiterhin beinhaltend ein Trennelement (2), das eine Halterungsstruktur definiert, welche besagte Halterungsstruktur mit einer Ausnehmung (13) ausgeführt ist, die sich über einen Umfangsteil der besagten Aniloxwalze erstreckt, und wobei das besagte Hinterfütterungselement (5) in der besagten Ausnehmung gehalten wird;

und beinhaltend einstellbare Mittel (12), die mit dem Trennelement einstellbar im Eingriff stehen, um eine im wesentlichen radial gerichtete Kraft auf das besagte Hinterfütterungselement auszuüben und das Trennelement (3) gegen die Oberfläche der Aniloxwalze (10) anzudrücken.

9. Eine Anordnung nach Anspruch 6, weiterhin beinhaltend Rakelmittel (23, 33), die eine axiale Länge aufweisen, die sich bis zum Trennelement erstreckt, welche besagten Rakelmittel (23, 33) mit einer Kantenpartie mit dem besagten Hinterfütterungselement (5) aus zusammendrückbarem Material in Berührung steht, um es dem zusammendrückbaren Material zu ermöglichen, sich gegen die Rakelmittel auszubauchen und die Kante der Rakelmittel abzudichten.

10. Eine Anordnung nach Anspruch 1, weiterhin beinhaltend ein Trennelement (2), das eine Halterungsstruktur definiert;

elastische Hinterfütterungsmittel (5) zum elastischen Unterstützen des besagten Streifenelements (3) an der Halterungsstruktur für eine in dem Teil des Umfangs in hohem Maße gleichmäßige elastische Berührung des Streifenelements mit der Aniloxwalze (10);

Rakelmittel (23, 33), angeordnet am Farbkasten (11) und

Mittel (41, 42; 50, 51, 52), welche den Farbkasten beweglich abstützen, zum Zweck des selektiven Eingriffs der Rakelmittel an der Aniloxwalze oder des Abhebens der Rakelmittel um einen

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kleinen Abstand, der ausreicht, um die Rakelmittel von der Aniloxwalze freizubekommen, während die elastische Berührung des Streifenelements (3) mit der Aniloxwalze (10) beibehalten und das Aufbringen der Trennflüssigkeit auf die Aniloxwalze mit den besagten Flüssigkeits-Anwendungsmitteln fortgesetzt wird.

11. Eine Anordnung nach Anspruch 10, in welcher die besagten Mittel zum Aufbringen des hydraulischen Trennflüssigkeitsfilms zwei dochartige Kissenelemente (21, 31) aus einer porösen Substanz beinhalten, die fluchtend mit dem besagten Streifenelement (3) an den äußersten Enden des Streifenelements angeordnet sind;

in welcher zwei Rakeln vorgesehen sind, die die besagten Rakelmittel bilden, wobei eine erste Rakel (23) der Aniloxwalze in der einen Drehrichtung und eine zweite Rakel (33) der Aniloxwalze in der umgekehrten Drehrichtung zugeordnet ist;

und in welcher Anordnung die beweglichen Stützmittel den selektiven Angriff an der Aniloxwalze

- (a) der ersten Rakel,
- (b) der zweiten Rakel, und
- (c) keiner der Rakeln

ermöglicht, während die Aniloxwalze (10) mit mindestens einem der besagten Kissenelemente (21, 31) in der Position der Flüssigkeitsübertragung verbleibt.

12. In einer Flexodruckmaschine ein Farbkasten (11), beinhaltend eine Anordnung zum Aufteilen des Farbkastens in verschiedene axiale Zonen (10a, 10b, ...), um die Farbe auf eine Aniloxwalze (10) in verschiedenen axialen Zonen auftragen zu können und die Verwendung von Druckfarben mit jeweils unterschiedlichen Eigenschaften, z.B. in verschiedenen Farben, in den verschiedenen Zonen zu ermöglichen,

erfindungsgemäß beinhaltend

ein Trennelement (2) mit einer Fläche, die an der Aniloxwalze (10) anliegt und sich über einen Teil des Umfangs derselben erstreckt;

ein Trennstreifenelement (3) mit einer gekrümmten Fläche aus reibungsarmem Material, die gegen die Oberfläche der Aniloxwalze anliegt und an diese angepaßt ist;

ein Hinterfütterungsmittel (5) aus zusammen-drückbarem Material, befestigt an dem besagten Trennelement und das besagte Trennstreifenelement (3) in seiner Lage haltend und sich über einen Teil der Umfangslänge des besagten Trennelements (2) erstreckend;

ein Kissenelement (21, 31) aus einer flüssigkeitsdurchlässigen und porösen Substanz, gehalten von dem besagten Trennelement (2), angrenzend an die Endteile des Trennstreifenelements (3) und sich von den Endteilen des Trennstreifenelements weg erstreckend;

Mittel für die Flüssigkeitszufuhr (14a, 15a; 14b, 15b; 18), die eine Trennflüssigkeitsquelle mit dem besagten Kissenelement verbinden, um eine Trennflüssigkeit zu demselben zu fördern und infolgedessen auf der Oberfläche der Aniloxwalze (10) und zwischen der Oberfläche der Aniloxwalze (10) und dem Trennstreifenelement (3) einen Trennflüssigkeitsfilm ausbilden zu können;

und Mittel (12, 41, 42; 50, 51, 52) zum Anstellen des Trennelements (2) an die Oberfläche der Aniloxwalze (10).

13. Die Anordnung nach Anspruch 12, in welcher das besagte Trennstreifenelement Teflon einschließt, das besagte Hinterfütterungselement (5) Silikongummi einschließt und das besagte Kissen-element ein Filzkissen einschließt.

14. Die Anordnung nach Anspruch 12, in welcher das besagte Trennelement (2) eine Halterungsstruktur definiert;

zwei Kissenelemente vorgesehen sind, je eines an den äußersten Enden des Trennstreifenelements;

zwei Rakeln vorgesehen sind, eine erste Rakel (23), die der einen Drehrichtung der Aniloxwalze (10) zugeordnet ist und eine zweite Rakel (33), die der umgekehrten Drehrichtung der Aniloxwalze zugeordnet ist,

wobei die besagten Rakeln an dem besagten Farbkasten befestigt sind;

und in welcher Anordnung die Anstellmittel zum Anstellen des Trennelements gegen die Oberfläche der Aniloxwalze Mittel (41, 42; 50, 51, 52) beinhalten für die bewegliche Abstützung des Farbkastens zum Zweck des selektiven Anstellens einer der beiden besagten Rakeln an die Aniloxwalze in Abhängigkeit von der jeweiligen Drehrichtung der Aniloxwalze, oder zum Abheben beider Rakeln von der Oberfläche der Aniloxwalze durch Trennen der Rakelkanten von der Oberfläche der Aniloxwalze um einen kleinen Abstand, um die Aniloxwalze freizugeben, während die elastische Berührung des Streifenelements (3) mit der Aniloxwalze und mindestens eines Kissenelements mit der Aniloxwalze aufrechterhalten bleiben, um kontinuierlich Trennflüssigkeit zu der Aniloxwalze zu leiten und den besagten Trennflüssigkeitsfilm zwischen der Oberfläche der Aniloxwalze und der Oberfläche des Trennstreifenelements bilden zu können.

15. Verfahren zum gegenseitigen Abdichten von Druckfarben mit verschiedenen Eigenschaften in axialen Zonen (10a, 10b, ...) einer Aniloxwalze (10) mit Hilfe eines Trennelements (2, 3), beinhaltend den Schritt

der Einführung eines Umfangsringes eines Trennflüssigkeitsfilms zwischen den besagten Zonen durch Anlegen eines porösen, dochartigen Kissens gegen die Oberfläche der Aniloxwalze

(10), sättigen des besagten Kissens mit der besagten Flüssigkeit und Gleiten des besagten Elements auf dem besagten Film.

16. Verfahren gemäß Anspruch 15, bei welchem die besagte Flüssigkeit Wasser einschließt. 5

17. Verfahren gemäß Anspruch 15, beinhaltend den Schritt, ein separates Streifenelement (3) einzuführen, das eine reibungsarme Oberfläche hat, die nach der Oberfläche der Aniloxwalze (10) gekrümmt und an diese angepaßt ist, und die sich über einen Teil des Umfangs derselben erstreckt; 10

das besagte Trennstreifenelement elastisch gegen den besagten Ring oder Film aus der Trennflüssigkeit anzulegen, und

worin der besagte Schritt der Einführung des Umfangrings oder -films die Einführung einer gerade ausreichenden Flüssigkeitsmenge einschließt, um ein effektives Gleiten des Trennstreifens auf dem Flüssigkeitsfilm zu erreichen. 15

18. Verfahren gemäß Anspruch 15 für die Anwendung in einer Flexodruckmaschine, die zwei Rakeln (23, 33) aufweist, die selektiv an die Aniloxwalze (10) anstellbar oder von ihr abhebbar sind, 20

in welchem der Schritt der Einführung des besagten Flüssigkeitsfilms das Aufrechterhalten des besagten Flüssigkeitsfilms auf der Aniloxwalze und das Fortdauern des Schwimmens des Trennelements auf dem besagten Film einschließt, auch wenn die Rakeln von der Aniloxwalze abgehoben sind. 25 30

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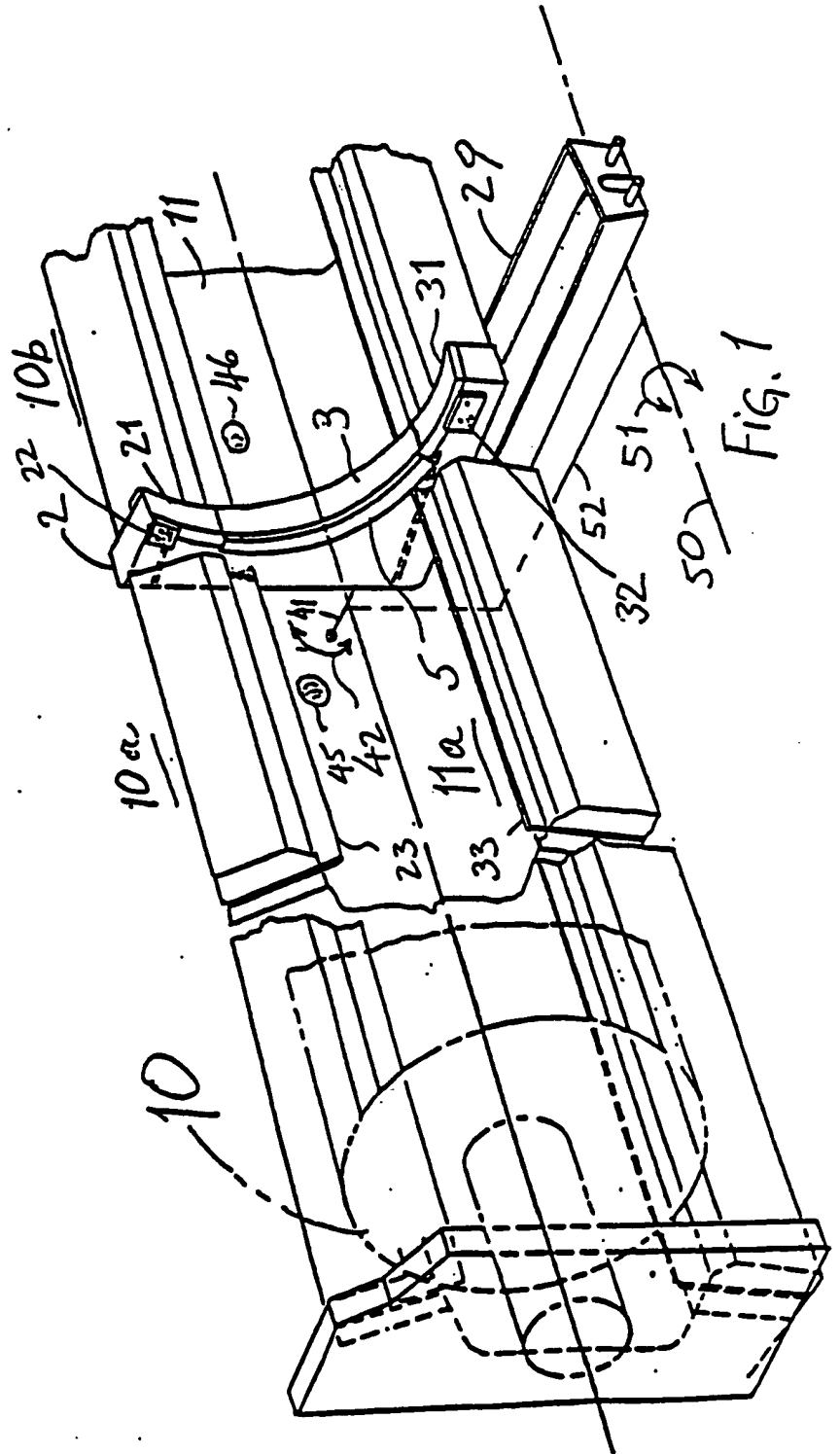


Fig. 1

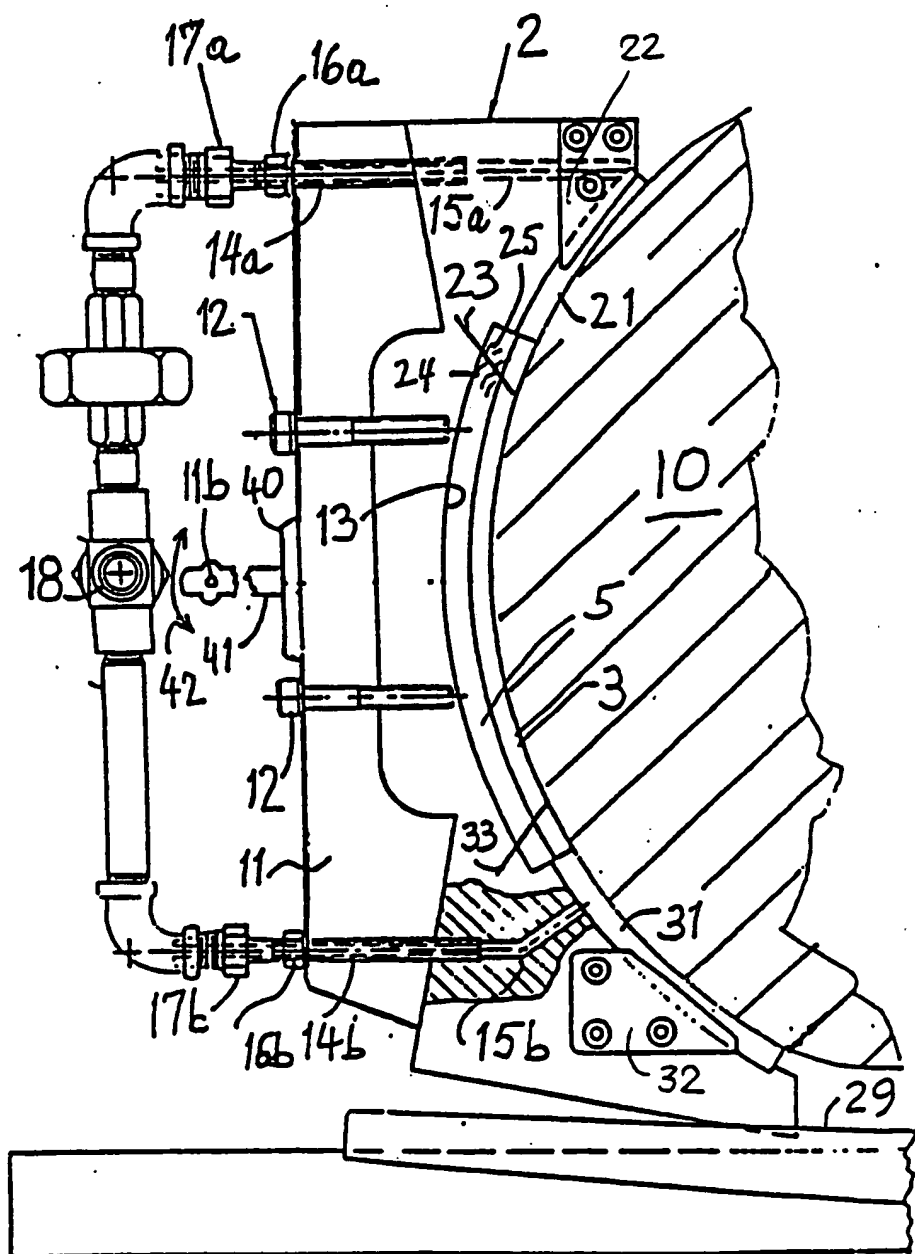


Fig. 2

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B41F 31/06

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B6C CEBE C104 C511 C514 C520

(56) Documents cited

GB 0924401 A US 4165688 A

(58) Field of search

UK CL (Edition L) B6C CEBB CEBE CEBX

INT CL^a B41F

On-line database: WPI

(54) Printing apparatus

(57) A divider seal 10 for a split-fountain chambered doctor blade for a printing press, comprising a seal contoured to sealingly engage a circumferential surface of a rotating cylinder, a seal retainer for retaining the seal in sealing engagement with the rotating cylinder, and pneumatic biasing structure, such as a pneumatic bladder, acting on the seal retainer for resiliently biasing the seal into sealing engagement with the rotating cylinder. The seal is located axially between the ends of the ink fountain 12 to allow different coloured inks to be used. A recess 38 is fed with water via channels 40, 42. Components of the seal may be of high molecular weight foam material aluminium or moulded plastics.

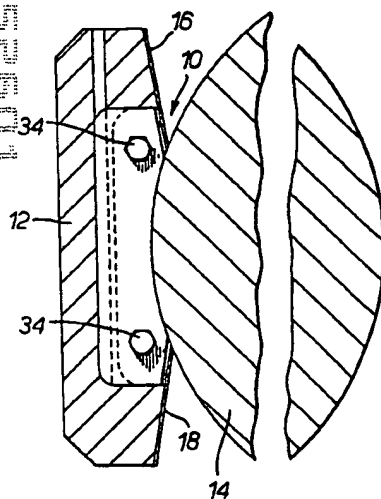


Fig. 1.

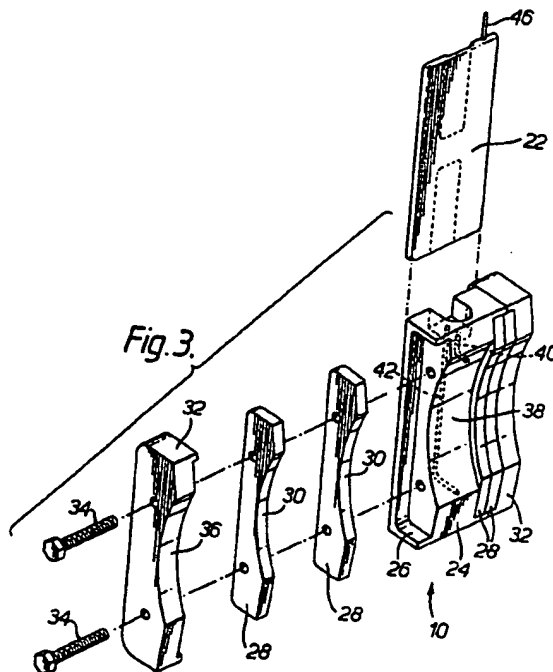


Fig. 3.

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

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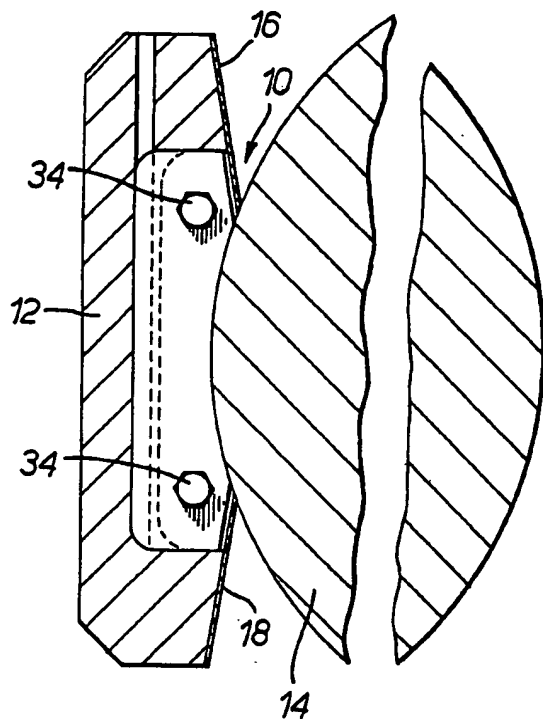
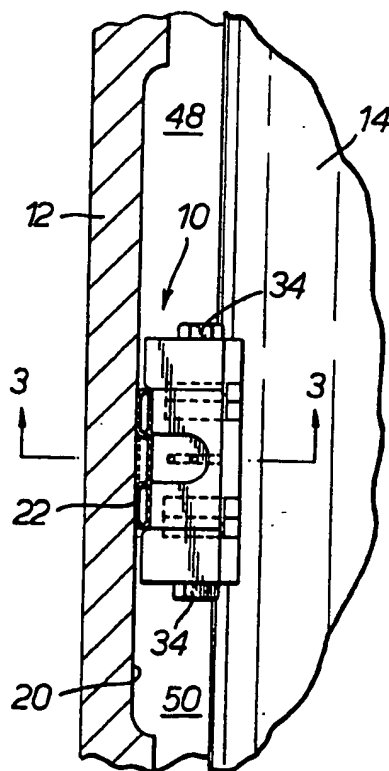


Fig. 1.

Fig. 2.



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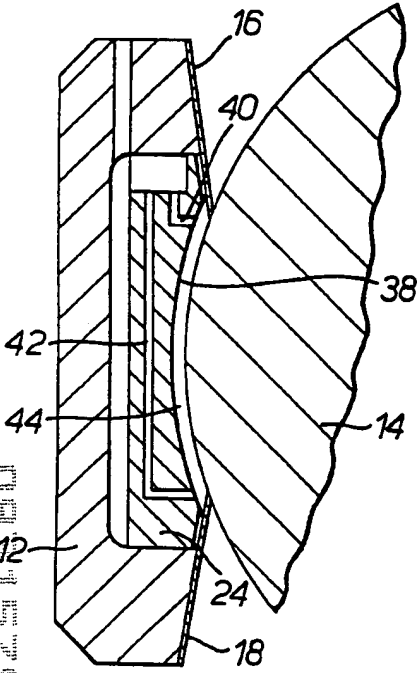


Fig. 4.

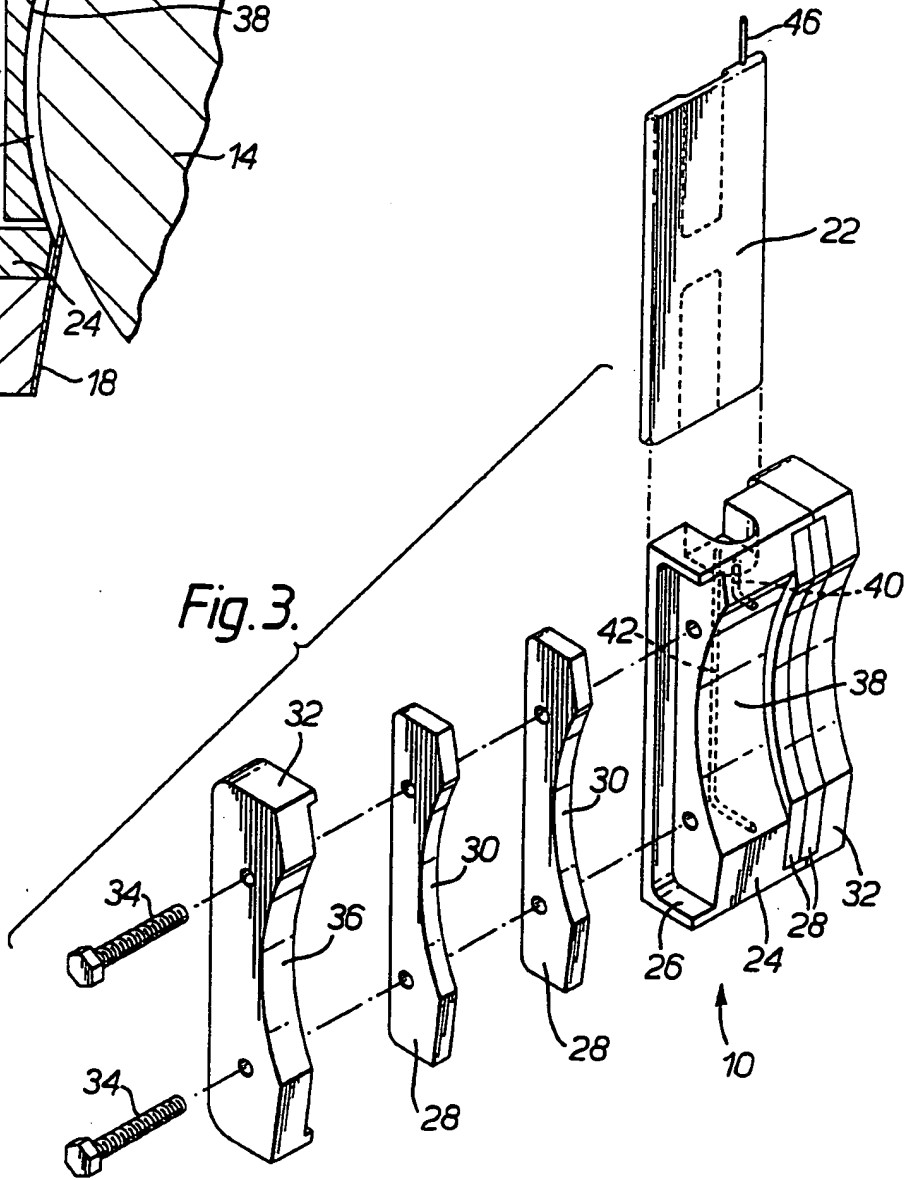


Fig. 3.

1 Printing Apparatus

2
3 The present invention relates particularly to flexographic printing
4 presses which utilise a chambered doctor blade ink fountain, and is
5 more particularly concerned with split-fountain chambered doctor
6 blades which permit simultaneous printing with two or more different
7 colour inks, where the seal of the present invention may be used to
8 divide the chambered doctor blade into two or more chambers.

9 Flexographic printing is a rotary letter press printing process
10 which traditionally uses flexible rubber, or other elastomer, printing
11 plates and liquid, fast drying ink. An advantage of flexographic printing
12 is its simple ink distribution system.

13 In flexographic printing, a web to be imprinted is passed between
14 an impression cylinder and a plate cylinder, from which the ink is
15 transferred to the web. Ink is applied to the plate cylinder in precisely-
16 controlled quantities by an anilox (R.T.M.)/metering roll. The circumferential
17 surface of the anilox roll is divided into a very large number of small cells
18 (typically, 15,000 cell per square centimetre). The surface of the anilox
19 roll is flooded with ink, thus filling the cells on the roll's surface. Ink is
20 fed to the anilox roll by an ink fountain. A commonly-used ink fountain
21 comprises an ink reservoir and a pair of doctor blades which contact the
22 anilox roll above and below the reservoir. The surface of the anilox roll,
23 the doctor blades and the reservoir define a closed chamber for
24 containing the ink. As the anilox roll rotates, the doctor blades shave the
25 surplus ink from the surface of the anilox roll so that ink is carried only in
26 the interior of the cells on the roll's surface and not on the lands
27 between cells. This results in a uniformly metered film of ink being
28 applied to the surface of the plate cylinder.

29 Typically, the ink fountain extends the entire length of the anilox
30 roll and plate cylinder. In cases where it is desired to print more than
31 one colour on a web, which requires more than one colour of ink, the
32 chamber containing the ink in the ink fountain is divided into two or
33 more subchambers or compartments by ink dams or dividers. These
34 dividers are designed to maintain a fluid-tight seal between
35 compartments in the ink fountain and to maintain a seal against the
36 anilox roll.

37 Ink fountain dividers per se are known in the art, and are
38 illustrated in, for example, U.S. patents 3,381,517, 4,559,871, 4,667,595,

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1 and 4,796,528.

2 These prior arrangements are mechanically very complex. They
3 are thus expensive to fabricate, require careful and precise alignment,
4 and are susceptible to misalignment in use. There is therefore a need
5 for a simple, inexpensive divider seal which is easy to fabricate and
6 install, requires no time-consuming alignment, can compensate for wear
7 and misalignment, and still provides an effective divider seal. The
8 present invention fulfils that need.

9 The present invention is a divider seal for a split-fountain
10 chambered doctor blade for a printing press, comprising seal means
11 contoured to sealingly engage a circumferential surface of a rotating
12 cylinder, retaining means for retaining the seal means in sealing
13 engagement with the rotating cylinder, and pneumatic biasing means
14 acting on the retaining means for resiliently biasing the seal means into
15 sealing engagement with the rotating cylinder.

16 The pneumatic biasing means offers a high degree of compliance
17 and allows for variations in wear and alignment in use.

18 An example of apparatus according to this invention is shown in
19 the accompanying drawings in which:

20 Figure 1 is a side elevational view, partially in section, of an ink
21 fountain and an anilox roll, of which the ink fountain is equipped with the
22 divider seal according to the present invention.

23 Figure 2 is a top plan view, partially broken away, of the divider
24 seal and anilox roll shown in Figure 1.

25 Figure 3 is an exploded view of the divider seal according to the
26 present invention.

27 Figure 4 is a sectional view, partially broken away, taken along
28 the lines 3-3 of Figure 2.

29 Referring now to the drawings, wherein like numerals indicate like
30 elements, there is shown in Figure 1 a divider seal 10 according to the
31 present invention mounted in a chambered doctor blade ink fountain 12,
32 in sealing engagement with an anilox roll 14. Anilox roll 14 has already
33 been described and is known in the art, and need not be described in
34 further detail, except to note that, as previously described, anilox roll 14
35 rotates on its axis relative to ink fountain 12. Also, ink fountain 12 has
36 already been described and is known in the art, and will be described
37 only with the degree of detail necessary to understand the present
38 invention. In that regard, ink fountain 12 comprises upper and lower

1 doctor blades 16 and 18 which contact the surface of the anilox roll and
2 meter the amount of ink supplied to the anilox roll by ink fountain 12.
3 Doctor blades 16 and 18 are conventional and known in the art.

4 As seen in Figure 1, divider seal 10 has a sealing surface which is
5 contoured to and contacts the surface of anilox roll 14 which extends
6 into ink fountain 12 between doctor blades 16 and 18. Divider seal 10 is
7 otherwise dimensioned to fit within the chamber of chambered doctor
8 blade ink fountain 12, which is of uniform cross-section.

9 Figure 2 illustrates the divider seal 10 as seen from above, with
10 ink fountain 12 partially in section to permit divider seal 10 to be clearly
11 seen. As best seen in Figure 2, divider seal 10 is spaced a short
12 distance from the rear wall 20 of ink fountain 12. Between the rear wall
13 of ink fountain 12 and divider seal 10 is a biasing means in the form of a
14 pneumatic bladder 22. Pneumatic bladder 22 may be pressurised and
15 depressurised to apply more or less biasing force to divider seal 10,
16 thereby controlling the loading force of divider seal 10 against anilox roll
17 14.

18 Referring now to Figure 3, the various parts of divider seal 10 are
19 shown in an exploded view. Divider seal 10 comprises a manifold 24,
20 which includes lateral recesses on either side. Recess 26 is visible in
21 Figure 3. Recess 26 receives at least one, and preferably two, seal
22 members 28. Seal members 28 are preferably made of an ultrahigh
23 molecular weight closed foam material, and each seal means has a
24 contoured surface 30 contoured to the curvature of anilox roll 14 so as
25 to intimately engage the surface of anilox roll 14 when the seal means
26 28 are brought into contact with the surface of anilox roll 14. Seal
27 means 28 and end cap 32 may be retained on manifold 24 by any
28 suitable means, such as threaded fasteners 34. End cap seal 32 also
29 has a contoured surface 36, which has substantially the same contour
30 as contoured surface 30 of seal means 28.

31 Manifold 24 is substantially symmetrical along its longitudinal axis,
32 and therefore receives a pair of seal means 28 and an end cap seal 32
33 on both sides.

34 Manifold 24 may be made of any suitable material. For example,
35 manifold 24 may, for example, be machined from aluminium, or
36 moulded in plastic. A preferred material for manifold 24 is aluminium
37 with a Teflon (Registered Trade Mark) coating. End cap seals 32 are
38 preferably moulded from an ultrahigh molecular weight plastic.

1 It will be seen in Figure 3 that, as with seal means 28 and end cap
2 seals 32, manifold 24 has a contoured surface 38. However, contoured
3 surface 28 is contoured to a curvature having a radius slightly greater
4 than the curvature of contoured surfaces 30 and 36 of seal means 28
5 and end cap seals 32. This provides a small gap between anilox roll 14
6 and contoured surface 38, as best seen in Figure 3.

7 Referring now to Figure 4, manifold 24 is shown in section.
8 Manifold 24 includes a pair of liquid flow channels 40 and 42. (Channels
9 40 and 42 are shown in phantom in figure 3.) These channels serve to
10 supply and drain water to the gap 44 between contoured surface 38 and
11 anilox roll 14. Gap 44 forms a water reservoir defined by contoured
12 surface 38, anilox roll 14 and top and bottom doctor blades 16 and 18.
13 Water is preferably supplied to reservoir 44 through flow channel 40 and
14 drained, preferably by vacuum, through channel 42. The water in
15 reservoir 44 fills the interstices in seal means 28, so that there is a film of
16 water between seal means 29 and the surface of anilox roll 14. The film
17 of water serves as both a low-friction bearing and a fluid seal.

18 Seal means 28 are biased into sealing engagement with anilox
19 roll 14 by the pneumatic bladder 22. Bladder 22 is positioned between
20 manifold 24 and the rear wall 20 of ink fountain 12, as previously
21 described. Air is supplied to and exhausted from bladder 22 through an
22 air supply conduit 46. By pressurising bladder 22, seal means 28 are
23 biased into sealing engagement with the surface of anilox roll 14. The
24 biasing force can be controlled by controlling the internal pressure of
25 bladder 22. Since bladder 22 is pneumatically pressurised, bladder 22
26 is resilient. That is, bladder 22 permits divider seal 10 to move toward
27 and away from rear wall 20 as anilox roll 14 rotates, to compensate for
28 variations in the surface of anilox roll 14, such as a slightly out-of-round
29 condition or slight misadjustment, for example where the ink fountain 12
30 is not exactly parallel to the axis of anilox roll 14. In addition, bladder 22
31 enables divider seal 10 to move toward anilox roll 14 to compensate for
32 wear of both the surface of anilox roll 14 and the contoured surfaces 30
33 of the seal members 28, as a result of normal use. Since air is a
34 compressible fluid, bladder 2 can be pressurised to a degree that will
35 enable divider seal 10 to move toward and away from rear wall 20 of ink
36 fountain 12, as may be required by out-of-round conditions in anilox roll
37 14, misalignments, and wear.

38 It will be appreciated that ink fountain 12 can be divided into two

1 or more compartments (see Figure 2) by using one or more divider
2 seals 10. Thus, ink fountain 12 may be divided into two compartments
3 48 and 50 by using a single divider seal 10. If two divider seals are
4 used, ink fountain 12 can be divided into three compartments, and so
5 on, so that any number of compartments as desired may be provided.

6 It will also be noted that neither bladder 22 nor divider seal 10 are
7 fixedly attached to rear wall 20 of ink fountain 12. Thus, divider seal 10
8 can be placed at any desired location along anilox roll 14, so that the
9 lateral extent of the compartments 48 and 50 can be infinitely variable.
10 Thus, the invention permits not only any desired number of
11 compartments to be formed in ink fountain 12, but enables the lateral
12 extent of the compartments so formed to be infinitely varied as desired.
13 Hence, the present invention makes it very simple to reconfigure ink
14 fountain 12 for different colours and dimensions. This reduces set-up
15 time between printing runs, thereby reducing press down time and
16 increasing equipment utilisation and throughput.
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Claims

1. A divider seal for a split-fountain chambered doctor blade for a printing apparatus, comprising
 - a. seal means contoured to sealingly engage a circumferential surface of a rotating cylinder,
 - b. movable retaining means for retaining the seal means in sealing engagement with the rotating cylinder,
 - c. pneumatic biasing means movable with the retaining means and acting on the retaining means for resiliently biasing the seal means into sealing engagement with the rotating cylinder.
2. A divider seal according to claim 1, wherein the pneumatic biasing means comprises a pneumatic bladder.
3. A divider seal according to claim 2, further comprising means for selectably increasing and decreasing the pneumatic pressure in the bladder.
4. A divider seal according to claim 2, wherein the seal means comprises an ultra-high molecular weight closed foam.
5. A divider seal according to claim 1, further comprising a gap between the retaining means and the circumferential surface of the rotating cylinder, and means for supplying a liquid to said gap to form a liquid interface between said retaining means and circumferential surface.
6. A flexographic printing apparatus having an anilox roll and a chambered doctor blade ink fountain adjacent the anilox roller for applying printing ink thereto, a movable divider seal for dividing the doctor blade chamber into at least two compartments, the compartments containing different colour inks therein, said divider seal comprising a seal member contoured to and in sealing engagement with the outer circumferential surface of the anilox roller, a seal retainer for retaining the seal member in engagement with the circumferential surface of the anilox roller, and an inflatable and deflatable pneumatic bladder mounted between the back surface of the seal retainer and an

1 opposed wall of the doctor blade assembly for applying a biasing force
2 to the seal retainer and the seal member for resiliently biasing the seal
3 member into engagement with the circumferential surface of the anilox
4 roller.

5
6 7. A divider seal according to claim 6, wherein said
7 pneumatic bladder is positioned between the seal retainer and a rear
8 wall of the ink fountain.

9
10 8. A divider seal according to claim 7, wherein the divider
11 seal is infinitely positionable along the length of the anilox roll between
12 the anilox roll and said rear wall of the ink fountain.

13
14 9. Printing apparatus comprising an ink fountain mounted
15 adjacent to a roll adapted to receive a film of ink from the fountain, the
16 fountain comprising means defining an ink chamber extending parallel
17 to the axis of the roll, at least a portion of the chamber being of uniform
18 cross-section and containing chamber divider which is selectively
19 positionable at various positions in the uniformly sectioned part of the
20 chamber and includes at least one sealing portion having a concave
21 surface adjacent to and conforming with the surface of the roll, and
22 including a bladder positioned between a back surface of the divider
23 and an opposed wall of the chamber and adapted to seal the gap
24 between the said back surface and the chamber wall and, when
25 pressurised, to bias the concave seal surface of the divider resiliently
26 into sealing engagement with the roll.

27
28 10. Printing apparatus according to claim 9, in which the said
29 back surface of the divider and the said opposed chamber wall are both
30 substantially flat and are both substantially parallel to a tangent to the
31 roll at approximately a mid-point along the said concave surface of the
32 sealing portion, whereby expansion of the bladder produces a series of
33 biasing forces on the divider which are substantially parallel to a radius
34 of the roll at the said mid-point.

35
36 11. Printing apparatus according to claim 9 or claim 10, in
37 which the chamber divider includes a second sealing portion spaced
38 from and similar to the first-mentioned sealing portion, the surface of the

divider between the sealing portions being recessed to define a semi-annular chamber adjacent to the roll, and including means for delivering liquid into the semi-annular chamber to form an additional barrier, supplementing the sealing effects of the seal portions, between inks contained during use in the portions of the ink chamber on opposite sides of the divider.

12. Apparatus according to any one of claims 1 to 11 and substantially as described with reference to the accompanying drawings.

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Databases (see over)

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(ii) ONLINE DATABASE: WPI

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26 MARCH 1993

Documents considered relevant following a search in respect of claims 1-12

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
GB 0924401 A - (TIMSON) see element 5, figure 2		1-3, 6, 9
US 4165688 A - (MAGNA-GRAPHICS) see example figure 2		1-3, 6, 9

SF2(p)

ab - doc99\fil000658

W019573

Category	Identity of document and relevant passages	Relevant to claim(s)
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">09315796-052601</p>		

Categories of documents

X: Document indicating lack of novelty or of inventive step.

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A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

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12

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54 High velocity, hot air dryer and extractor.

57 A hot air dryer (10) utilizes high velocity air jets which scrub and break up the moist air layer which clings to the surface of a freshly printed sheet (S). High velocity air is heated to a high temperature as it flows along a resistance heating element (38) within an air delivery baffle tube (64). The heated, high velocity air pressurizes a plenum chamber (46) within an air distribution manifold (36W). High velocity jets of hot air are discharged through multiple airflow apertures (54) onto the wet ink side of a printed sheet as it moves through a dryer exposure zone (Z). An extractor (40) removes the moist air layer, high velocity hot air and volatiles from the printed sheet (S) and from the press (12).

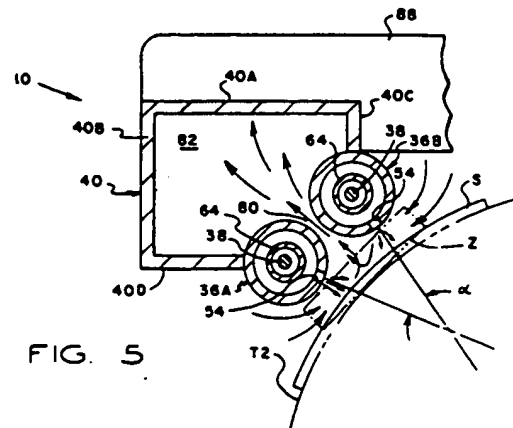


FIG. 5

EP 0 647 524 A1

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This invention relates generally to accessories for sheet-fed, rotary offset and flexographic printing presses, and in particular to a dryer for printed materials which utilizes high velocity, hot air flow and extraction.

In the operation of a rotary offset press, an image is reproduced on a web or sheet of paper or some other printable substrate by a plate cylinder which carries the image, a blanket cylinder which has an ink transfer surface for receiving the inked image, and an impression cylinder which presses the paper against the blanket cylinder so that the inked image is transferred to the paper. In some applications, a protective and/or decorative coating is applied to the surface of the freshly printed sheets. The freshly printed sheets are then transported to a sheet delivery stacker in which the printed sheets are collected and stacked.

The relatively wet condition of the printing ink composition and its solvent and/or diluent components and a layer of moisture laden air which clings to the surface of the freshly printed web or sheet may interfere with the quality of the images as they are printed at each succeeding printing unit. For example, the quality of colored images, half-tone illustrations and the like undergo degradation in the uniformity of their appearance and color because of the presence of the wet ink, volatiles, and moisture within the printed substrate. Moreover, protective coatings will undergo dilution and surface degradation causing a dull finish if the underlying substrate is not dried sufficiently before the coating is applied.

Such defects, including uneven surface appearance of protective/decorative coatings, detract from the appearance of the underlying images or photographs, particularly in the case of multi-colored images or photographs. The defects are caused by residual volatile solvents, diluents, water and the like within the oleoresinous inks of the images, and the presence of moisture in the printed material, at the time that the next successive image is printed or the protective/decorative coating is applied. Because the defects are compounded as the printed material moves through successive printing units, it is desirable that curing and drying be initiated and volatiles and moisture laden air be extracted at each interstation position, as well as at the delivery position.

Hot air dryers and radiant heaters have been used as delivery dryers and as interstation dryers. Interstation dryers employing radiant heat lamps are best suited for slow to moderate press speeds in which the exposure time of each printed sheet to the radiant heat is long enough to initiate ink setting. For high speed press operation, for example, at 5,000 sheets or more per hour, there is not enough available space at the interstation position

to install a radiant heater having sufficient number of heat lamps for adequate drying purposes.

As press speed is increased, the exposure time (the length of time that a printed sheet is exposed to the radiant heat) is reduced. Since the number of lamps is limited by the available interstation space, the output power of the radiant lamps has been increased to deliver more radiant energy at higher temperatures to the printed sheets in an effort to compensate for the reduction in exposure time. The increased operating temperatures of the high-powered radiant heat lamps cause significant heat transfer to the associated printing unit and other equipment mounted on the press frame, accelerated wear of bearings and alterations in the viscosities of the ink and coating, as well as upsetting the balance between dampening solution and ink. The heat build-up may also cause operator discomfort and injury.

To handle high speed press operations, an off-press heater has been utilized from which high velocity, heated air is conveyed through a thermally insulated supply duct to a discharge plenum which directs high velocity, heated air onto the printed stock as it moves across the interstation dryer position. Such off-press heaters have proven to be relatively inefficient because of excessive heat loss and pressure drop along the supply duct. Attempts to overcome the heat loss and pressure drop have resulted in substantially increased physical size of the heater equipment (blower fan and supply duct) along with a substantial increase in the electrical power dissipated by the off-press heater.

According to the present invention, a high efficiency hot air dryer utilizes an on-press heater for producing high velocity hot air flow for accelerating the setting of inks on a freshly printed substrate. The on-press heater includes a housing member having a sidewall defining a manifold air distribution or plenum chamber, with the sidewall being intersected by an airflow discharge port. An air delivery tube has an inlet port for receiving high velocity airflow and has a tubular sidewall disposed in the plenum chamber. An elongated heating element is disposed within the inner airflow passage of the air delivery tube. High velocity air is discharged into the air delivery tube in heat transfer contact along the length of the heating element.

Heated, high velocity air is discharged out of the air delivery tube into the plenum chamber of the housing member. Preferably, the high velocity air is supplied to the manifold plenum chamber through an inlet port having an inlet flow area which is greater than the outlet flow area of the hot air discharge port. By this arrangement, heated air will be supplied to the plenum chamber faster than it can be discharged, so that the heated air will be

compressed within the manifold plenum chamber. This assures that jets of hot air which are discharged through multiple outlet apertures are uniform in pressure and velocity along the length of the dryer head, so that the printed sheet is dried uniformly as it is transferred through the exposure zone of the dryer.

According to another aspect of the present invention, the moist air layer is displaced from the surface of the printed sheet by high-velocity hot air jets which scrub and break-up the moisture-laden air layer that adheres to the printed surface of the sheet. The high-velocity hot air jets create turbulence which overcomes the surface tension of the moisture and separates the moisture laden air from the surface of the printed material. The moisture vapor and volatiles become entrained in the forced air flow and are removed from the printing unit by a high volume extractor.

The scrubbing action of the high velocity hot air jets is improved by adjacent rows of multiple discharge apertures which are oriented to deliver a converging pattern of high velocity hot air jets into an exposure zone across the sheet travel path. The high velocity hot air jets are produced by a pair of elongated dryer heads in which high velocity air is heated by heat transfer contact with a resistance heating element within an air delivery baffle tube. Since the release of moisture and other volatiles from the ink and printed material occurs continuously in response to the absorption of thermal energy, the moisture laden air layer is displaced continuously from the printed sheet as the printed sheet travels through the dryer exposure zone in contact with the converging hot air jets.

According to another aspect of the invention, the moisture-laden air, volatiles and hot air completely exhausted from the printing unit by a high volume extractor. An extractor manifold is coupled to a pair of elongated dryer heads and draws the moisture-laden air, volatiles and high velocity hot air from the exposure zone through a longitudinal air gap between the dryer heads. According to this arrangement, the setting of ink on each printed sheet is initiated and accelerated before the sheet is run through the next printing unit.

Operational features and advantages of the present invention will be understood by those skilled in the art upon reading the detailed description which follows with reference to the attached drawings, wherein:

FIGURE 1 is a schematic side elevational view in which multiple dryers of the present invention are installed at interstation positions in a four color offset rotary printing press;

FIGURE 2 is a simplified side elevational view showing the dryer of the present invention installed in an interstation position between two

printing units of FIGURE 1;

FIGURE 3 is a bottom plan view showing installation of the dryer assembly of FIGURE 2 in the interstation position;

FIGURE 4 is a perspective view of the interstation dryer shown in FIGURE 2;

FIGURE 5 is a sectional view of the improved dryer of the present invention taken along the line 5-5 of FIGURE 4;

FIGURE 6 is a longitudinal sectional view of the dryer assembly shown in FIGURE 2;

FIGURE 7 is a sectional view of the dryer assembly shown in FIGURE 2, taken along the line 7-7 of FIGURE 6;

FIGURE 8 is a perspective view of a resistance heating element used in the dryer of FIGURE 2;

FIGURE 9 is a perspective view similar to FIGURE 8, with the resistance heating element enclosed in a support sheath;

FIGURE 10 is a view similar to FIGURE 4 which illustrates an alternative embodiment of the dryer head in which the discharge port is formed by an elongated slot; and,

FIGURE 11 is a perspective view, partially broken away, of the dryer head shown in FIGURE 10.

As used herein, the term "processed" refers to various printing processes which may be applied to either side of a sheet, including the application of inks and/or coatings. The term "substrate" refers to sheet material or web material.

Referring now to FIGURE 1, the high velocity hot air dryer 10 of the present invention will be described as used for drying freshly printed substrates, which are successively printed at multiple printing units in a sheet-fed, rotary offset printing press. In the exemplary embodiment, the dryer 10 of the present invention is installed at an interstation position between two printing units of a four color printing press 12 which is capable of handling individual printed sheets having a width of the approximately 40" (102 millimeters) and capable of printing 10,000 sheets per hour or more, such as that manufactured by Heidelberg Druckmaschinen AG of Germany under its designation Heidelberg Speedmaster 102V.

The press 12 includes a press frame 14 coupled on the right end to a sheet feeder 16 from which sheets, herein designated S, are individually and sequentially fed into the press, and at the opposite end, with a sheet stacker 18 in which the printed sheets are collected and stacked. Interposed between the sheet feeder 16 and the sheet stacker 18 are four substantially identical sheet printing units 20A, 20B, 20C and 20D which can print different color inks onto the sheets as they are moved through the press.

As illustrated in FIGURE 1, each sheet fed printing unit is of conventional design, each unit including a plate cylinder 22, a blanket cylinder 24 and an impression cylinder 26. Freshly printed sheets S from the impression cylinder 26 are transferred to the next printing unit by transfer cylinders T1, T2, T3. A protective coating may be applied to the printed sheets by a coating unit 28 which is positioned adjacent to the last printing unit 20D.

The freshly printed and coated sheets S are transported to the sheet stacker 18 by a delivery conveyor system, generally designated 30. The delivery conveyor 30 is of conventional design and includes a pair of endless delivery gripper chains 32 carrying laterally disposed gripper bars having a gripper element for gripping the leading edge of a freshly printed sheet S as it leaves the impression cylinder 26. As the leading edge of the printed sheet S is gripped by the grippers, the delivery chains 32 pull the gripper bar and sheet S away from the impression cylinder 26 and transports the freshly printed and/or coated sheet to the sheet stacker 18.

Prior to delivery, the freshly printed sheets S pass through a delivery dryer 34 which includes a combination of infra-red thermal radiation, forced air flow and extraction.

Referring now to FIGURE 2, FIGURE 5 and FIGURE 6, the interstation dryer 10 includes as its principal components a dryer head 36, a resistance heating element 38, and an extractor head 40. As shown in FIGURE 3, the dryer head 36 is mounted on the press side frame members 14A, 14B by side frame flanges 42, 44. In this interstation position, the dryer head 36 is extended laterally across and radially spaced from the interstation transfer cylinder T2, thereby defining an exposure zone Z.

The dryer head 36 includes a tubular sidewall 36W which encloses an air distribution manifold chamber 46. The air distribution manifold housing is sealed on opposite ends by end plates 48, 50, respectively, and is sealed against the extractor head 40. The manifold housing has an inlet port 52 for admitting high velocity, pressurized air through a supply duct 52 from an off-press compressor 53, and has a discharge port for delivering pressurized hot air into the exposure zone Z.

As shown in FIGURE 6, the air distribution manifold sidewall 36W is intersected by multiple discharge apertures 54 which collectively define the discharge port. The apertures 54 are oriented for discharging pressurized jets of high velocity, hot air toward the interstation transfer cylinder T2, and are longitudinally spaced along the dryer head 36. According to this arrangement, pressurized air jets are directed along a straight line across the printed side of a sheet S as it moves through the dryer exposure zone Z. In an alternative embodi-

ment, as shown in FIGURE 10 and FIGURE 11, the discharge port is formed by an elongated slot 55 which intersects the dryer head sidewall 36W and extends longitudinally along the dryer head.

Referring now to FIGURE 6 and FIGURE 7, the resistance heating element 38 is coupled to the dryer head 36 by and end block 56. The end block 56 has a body portion which is intersected by an axial bore 58, a counterbore 60 and a radial inlet bore 62 which communicates with the counterbore. The heating element 38 has an end portion 38A which projects through the axial bore 58 and counterbore 60, with the elongated body portion of the heating element 38 extending into the plenum chamber 46.

According to an important feature of the present invention, the plenum chamber 46 is partitioned by an elongated air delivery baffle tube 64 which extends substantially the entire length of the dryer head 36. The air delivery baffle tube 64 has an inlet port 66 for receiving high velocity airflow from a remote supply and has a tubular sidewall 64A extending through the plenum chamber. The tubular sidewall 64A has an inner airflow passage 68 which connects the inlet port 66 in airflow communication with the plenum chamber 46 through its open end 64E. The air delivery baffle tube 64 has an end portion 64B projecting through the axial bore 60 of the end block 56, with its inner airflow passage 66 in airflow registration with the radial bore 62.

A pneumatic connector 70 is coupled to the radial inlet bore 62 of the end block 56 for connecting the inner airflow passage 68 to an off-press source of high velocity air. The end block 56 is sealed against the end plate 50, the tubular sheath 78 and against the pneumatic connector 70. High velocity, pressurized air is constrained to flow from the air duct 52 into the airflow passage 68 where it is discharged into the air distribution plenum chamber 46 after absorbing heat from the heating element 38.

As shown in FIGURE 6, the high velocity air flows longitudinally through the annular flow passage 68 in heat transfer contact with the heating element 38. The high velocity air is heated to a high temperature, for example 350 °F (176 °C), before it is discharged through the airflow apertures 54.

To provide uniform air jet discharge through the apertures 54, the inlet area of the inlet port 66 should be greater than the combined outlet area provided by the multiple airflow discharge apertures 54. In the preferred embodiment, the discharge apertures 54 have a diameter of 1/16 inch (0.158 cm), and for a 40" (102 mm) press there are 88 apertures spaced apart along the dryer head 36 on 0.446 inch (1.13 cm) centers. This yields a total

airflow outlet area of 0.269 square inch (1.735 square cm). Preferably, the effective inlet area of the inlet port 66 is at least about 0.54 square inch (3.484 square cm).

In the alternative dryer head embodiment shown in FIGURE 10, the air discharge slot 55 has a length of 40 inches (102 mm) along its longitudinal dimension L, and has an arc length C of 6.725 mils (17×10^{-3} cm).

With the preferred inlet/outlet ratio of about 2:1 or more, the high velocity, heated air will be supplied to the plenum chamber 46 faster than it can be discharged, so that the heated air will be compressed within the manifold plenum chamber. This assures that the jets of hot air which are discharged through the outlet apertures 54 are uniform in pressure and velocity along the length of the dryer head, so that the printed sheet is dried uniformly as it is transferred through the exposure zone Z.

The air distribution baffle tube 64 is supported on the inlet end by the end plate 50, and on its discharge end by flange segments 64F which engage the internal bore of the dryer head 36 and positions the baffle tube in the center of the plenum chamber 46.

Referring now to FIGURE 6, FIGURE 7, FIGURE 8 and FIGURE 9, the heating element 38 is preferably an electrical resistance heater having elongated resistance heater sections 38C, 38D which are integrally formed and folded together about at a common end 38E. The resistance sections 38C, 38D are substantially co-extensive in length with the air delivery baffle tube 64. Each section 38C, 38D is electrically connected to a power conductor 72, 74, respectively, for connecting the resistance heating element 38 to an off-pressure source of electrical power.

The resistance heater sections 38C, 38D are mechanically stabilized by an end connector 76, and are enclosed within a tubular, thermally conductive sheath 78. Radial expansion of the half sections 38C, 38D is limited by the sidewall of the sheath 78, thus assuring efficient heat transfer, while the sheath provides longitudinal support for the elongated resistance heater sections within the inner airflow passage 68. The heating element half-sections 38C, 38D thus form a continuous loop resistance heating circuit which is energized through the power conductors 72, 74.

The tubular sheath 78 is received within the bore 58 and is welded to the end block 56. The tubular sheath 78 thus provides an opening through the end block 56 to permit insertion and withdrawal of the heating element 38 for replacement purposes. The heating element 38 is dimensioned for a sliding fit within the sheath 78 at ambient temperature. The end cap 76 is releasably secured to

the end block 56 by a hold-down metal strap (not illustrated). The distal end 78B of the sheath is sealed by an end cap 78C to prevent leakage of high velocity air out of the distribution manifold chamber 46.

Referring now to FIGURE 2, FIGURE 4, and FIGURE 5, the extractor head 40 is coupled to the back side of a pair of identical dryer heads 36A, 36B. The dryer heads 36A, 36B are separated by a longitudinal air gap 80 which opens in air flow communication with an extractor manifold chamber 82, thereby defining a manifold inlet port. The extractor manifold chamber 82 is enclosed by the end plates 48, 50 and by housing panels 40A, 40B, 40C and 40D. The extractor housing panels 40C, 40D are secured and sealed by a welded union to the dryer heads 36A, 36B.

According to another aspect of the present invention, the multiple air flow apertures 54 of each dryer head 36A, 36B are arranged in linear rows R1, R2, respectively, and extend transversely with respect to the direction of sheet travel as indicated by the arrows S in FIGURE 3. The rows R1, R2 are longitudinally spaced with respect to each other along the sheet travel path. Each air jet expands in a conical pattern as it emerges from the airflow aperture 54. Expanding air jets from adjacent rows intermix within the exposure zone Z, thereby producing turbulent movement of high velocity hot air which scrubs the processed side of the sheet S as it moves through the exposure zone Z. Preferably, balanced air pressure is applied uniformly across the exposure zone Z to ensure that the moist air layer is completely separated and extracted from the freshly printed sheets.

In the exemplary embodiment, the pressure of the high velocity air as it is discharged through the inlet port 66 into the heat transfer passage 68 is about 10 psi (7031 Kgs/m²). The inlet suction pressure in the longitudinal air gap 80 of the extractor is preferably about 5 inches of water (12.7×10^3 Kgs/cm³).

As shown in FIGURE 3 and FIGURE 5, the extractor manifold inlet port 80 is coupled in air flow communication with the exposure zone Z for extracting heat, moisture laden air and volatiles out of the dryer. The extractor manifold chamber 82 is coupled in air flow communication with an exhaust fan 84 by an air duct 86. The air duct 86 is coupled to the extractor manifold chamber 82 by a transition duct fitting 88.

The high velocity, heated air which is discharged onto the printed sheet S is also extracted along with the moisture and volatiles through the air gap 80 into the extractor chamber 82. Ambient air, as indicated by the curved arrows, is also suctioned into the exposure zone Z and through the longitudinal air gap, thus assuring that none of

TOP SECRET

the hot air, moisture or volatiles will escape into the press area. Extraction from the exposure zone Z is enhanced by directing the hot air jets along converging lines whose intersection defines an acute angle α , as shown in FIGURE 5.

The air flow capacity of the exhaust fan 84 is preferably about four times the total airflow input to the dryer heads. This will ensure that the exposure zone Z is maintained at a pressure level less than atmospheric thereby preventing the escape of hot air, moisture laden air and volatiles into the press room.

Claims

1. A hot air dryer (10) for installation in a printing press (12), said dryer comprising a dryer head (36) having a housing member (36W) defining an air distribution chamber (46), the housing member having an airflow inlet port (52) for receiving high velocity air and an airflow discharge port (54, 55) for directing heated air onto a substrate (S), and including a heating element (38) disposed in the air distribution chamber, characterized in that:
 - an air delivery tube (64) is disposed in the air distribution chamber, the air delivery tube having an elongated airflow passage (68) connecting the inlet port in airflow communication with the air distribution chamber; and
 - the heating element (38) is disposed within the elongated airflow passage (68) of the air delivery tube (64).
2. A hot air dryer (10) as defined in claim 1, characterized in that:
 - pneumatic connectors (70) are coupled to the air delivery tube (64) for connecting the elongated air flow passage (68) to a source of high velocity air.
3. A hot air dryer (10) as defined in claim 1 or claim 2, characterized in that:
 - electrical conductors (72, 74) are coupled to the heating element (38) for connecting the heating element to a source of electrical power.
4. A hot air dryer (10) as defined in any one of claims 1 to 3, characterized in that:
 - an end block (56) is coupled to the housing member (36) and to the air delivery tube (64) for sealing the interface between the air delivery tube and the housing member.
5. A hot air dryer (10) as defined in any one of claims 1 to 4, characterized in that:
 - an end block (56) is coupled to the housing member (36), the end block having a body portion intersected by an axial bore (58), a counterbore (60) and a radial inlet bore (62) communicating with the counterbore;
 - the heating element (38) having an end portion (38A) projecting through the axial bore and counterbore; and,
 - the air delivery tube (64) having an end portion (64B) disposed in the counterbore (60) with its elongated airflow passage (68) being coupled in airflow communication with the radial inlet bore (62).
6. A hot air dryer (10) as defined in any one of the preceding claims, characterized in that:
 - the elongated heating element (38) comprises an electrical resistance heater (38C, 38D).
7. A hot air dryer (10) as defined in claim 6, characterized in that:
 - the heating element (38) has first and second resistance heater sections (38C, 38D), the sections being joined at a common end (38E) and disposed in side-by-side relation.
8. A hot air dryer (10) as defined in any one of the preceding claims, characterized in that:
 - a tubular, thermally conductive sheath (78) is disposed within the elongated airflow passage (68); and,
 - the heating element (38) is disposed within the sheath.
9. A hot air dryer (10) as defined in any one of the preceding claims, characterized in that:
 - an extractor head (40) is coupled to the dryer head (36), the extractor head including a housing member (40A, 40B, 40C, 40D) defining an extractor manifold chamber (82), the extractor head having an elongated inlet port (80) for extracting air from a dryer exposure zone Z into the extractor manifold chamber, and having discharge means (84, 86, 88) coupled to the extractor head for exhausting air from the extractor manifold chamber.
10. A hot air dryer (10) as defined in any one of the preceding claims, characterized in that:
 - the airflow discharge port (54) comprises multiple airflow apertures.
11. A hot air dryer (10) as defined in any one of the preceding claims, characterized in that:
 - the air discharge port (54) comprises an elongated slot (55).

12. A hot air dryer (10) as defined in any one of the preceding claims, characterized in that:
the dryer head (36) is adapted for installation in an interstation position between adjacent printing press units (20A, 20B, 20C, 20D, 18) of a printing press (12), with the airflow discharge port (54, 55) facing the processed side of a substrate (S) as it is transported along a substrate travel path.
13. A hot air dryer (10) as defined in any one of the preceding claims, characterized in that:
the dryer (10) includes a second dryer head (36B) disposed in side-by-side relation with the first dryer head (36A) in a position facing the freshly processed side of a substrate (S) as it moves through a dryer exposure zone (Z) along a substrate travel path, the second dryer head (36B) having a housing member (36W) defining a second air distribution chamber (46), the housing member of the second dryer head including an inlet port (52) for receiving high velocity air and a discharge port (54, 55) oriented for directing heated air toward the sheet travel path, with the dryer heads being separated from each other by a longitudinal air gap (80); and,
an extractor head (40) is coupled to the dryer heads (36A, 36B), the extractor head including a housing member (40A, 40B, 40C, 40D) defining an extractor manifold chamber (82) and coupled in air flow communication with the longitudinal air gap (80), and having discharge means (84, 86, 88) coupled in air flow communication with the housing member for exhausting air from the extractor manifold chamber (82).
14. A hot air dryer (10) as defined in claim 13, characterized in that:
the discharge ports (54, 55) of the dryer heads are arranged in first and second rows (R1, R2), respectively, the rows being separated from each other along the substrate travel path, wherein heated air discharged from the discharge ports intermix with each other in the dryer exposure zone (Z).
15. A hot air dryer (10) as defined in claim 13 or claim 14, characterized in that:
the discharge ports (54, 55) of the first and second dryer heads are oriented for directing heated air along first and second converging lines (FIGURE 5), respectively.
16. A method for drying a freshly processed substrate (S) in a printing press (12) characterized by the steps:
directing high velocity air through an air delivery tube (64) which is disposed within an air distribution chamber (46);
heating high velocity air flowing through the air delivery tube by heat transfer contact with an elongated heating element (38) disposed within the air delivery tube; and,
discharging heated air from the air distribution chamber onto the freshly processed substrate (S).
17. A method for drying a freshly processed substrate (S) as defined in claim 16, characterized by the step:
compressing the heated air in the air distribution chamber (46) before the heated air is discharged.
18. A method for drying a freshly processed substrate (S) as defined in claim 16 or claim 17, characterised by the steps:
discharging heated air from the air distribution chamber (46) through an outlet port (54, 55); and
supplying the high velocity air to the air distribution chamber (46) through an inlet port (52) having an inlet flow area which is greater than the outlet flow area of the outlet port.
19. A method for drying a freshly processed substrate (S) as defined in any one of claims 16 to 18, characterised by the steps:
discharging jets of heated air from the air distribution chamber (46) through first and second rows (R1, R2) of outlet apertures (54, 55); and
intermixing air jets from the first and second rows in an exposure zone (Z).
20. A method for drying a freshly processed substrate (S) as defined in any one of claims 16 to 18, characterized by the steps:
discharging jets of heated, pressurized air from the air distribution chamber (46) through first and second rows (R1, R2) of outlet apertures; and
directing air jets discharged from air flow apertures of the first and second rows (R1, R2) along first and second converging lines (FIGURE 5), respectively.
21. A method for drying a freshly processed substrate (S) as defined in any one of claims 16 to 20, characterised by the steps:
installing first and second dryer heads (36A, 36B) in side-by-side relation on a printing press (12) in a position facing the processed side of a freshly processed substrate as it

travels through a dryer exposure zone (Z), the dryer heads being separated from each other by a longitudinal air gap (80);

supplying high velocity air to each dryer head (36A, 36B) through first and second air delivery tubes (64) which are disposed within an air distribution chamber (46) in each dryer head, respectively;

heating high velocity air flowing through each air delivery tube (64) by heat transfer contact with an elongated heating element (38) disposed within each air delivery tube;

discharging heated air from each dryer head through the dryer exposure zone (Z) and onto the freshly processed substrate (S); and

extracting air from the exposure zone (Z) through the longitudinal air gap (80).

flow rate of air discharged from the first and second dryer heads (36A, 36B).

22. A method for drying a freshly processed substrate (S) as defined in claim 21, characterized by the steps:

discharging heated air from each dryer head (36A, 36B) through an airflow outlet aperture (54, 55); and

supplying high velocity air to each dryer head through an inlet port (52) having an effective inlet flow area which is greater than the combined outlet flow areas of the air flow outlet apertures (54, 55).

23. A method for drying a freshly processed substrate (S) as defined in claim 21, or claim 22, characterised by the steps:

discharging jets of heated air from the first and second dryer heads (36A, 36B) through first and second rows (R1, R2) of outlet apertures (54, 55), respectively; and

intermixing air jets from the first and second rows in the exposure zone (Z).

24. A method for drying a freshly printed substrate (S) as defined in any one of claims 21 to 23, characterized by the steps:

discharging jets of heated air from the first and second dryer heads (36A, 36B) through first and second rows (R1, R2) of outlet apertures (54, 55), respectively; and

directing air jets discharged from air flow apertures of the first and second rows (R1, R2) along first and second converging lines (FIGURE 5), respectively.

25. A method for drying a freshly processed substrate (S) as defined in any one of claims 21 to 24, characterised by the step:

extracting air from the exposure zone (Z) at a volume flow rate through the longitudinal air gap (80) which exceeds the total volume

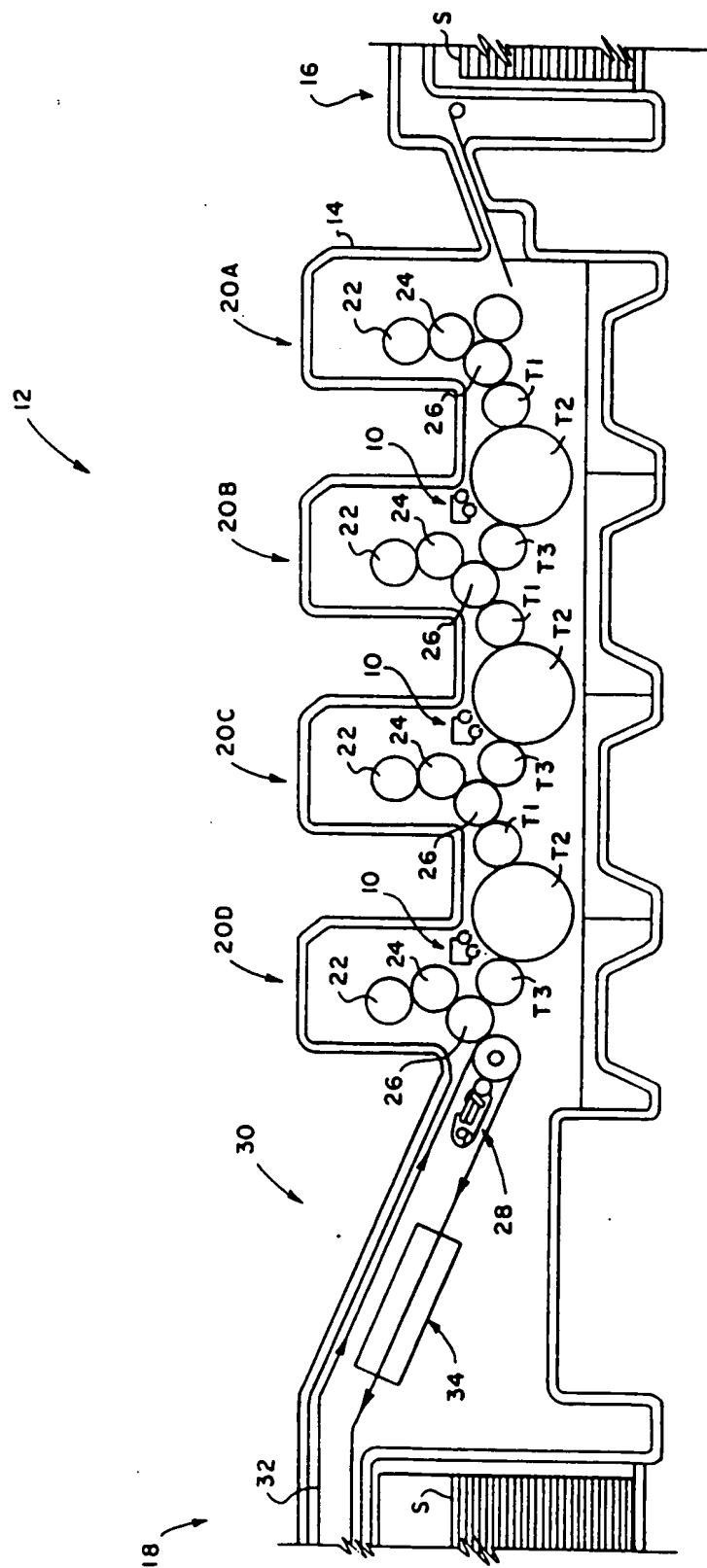


FIG. 1

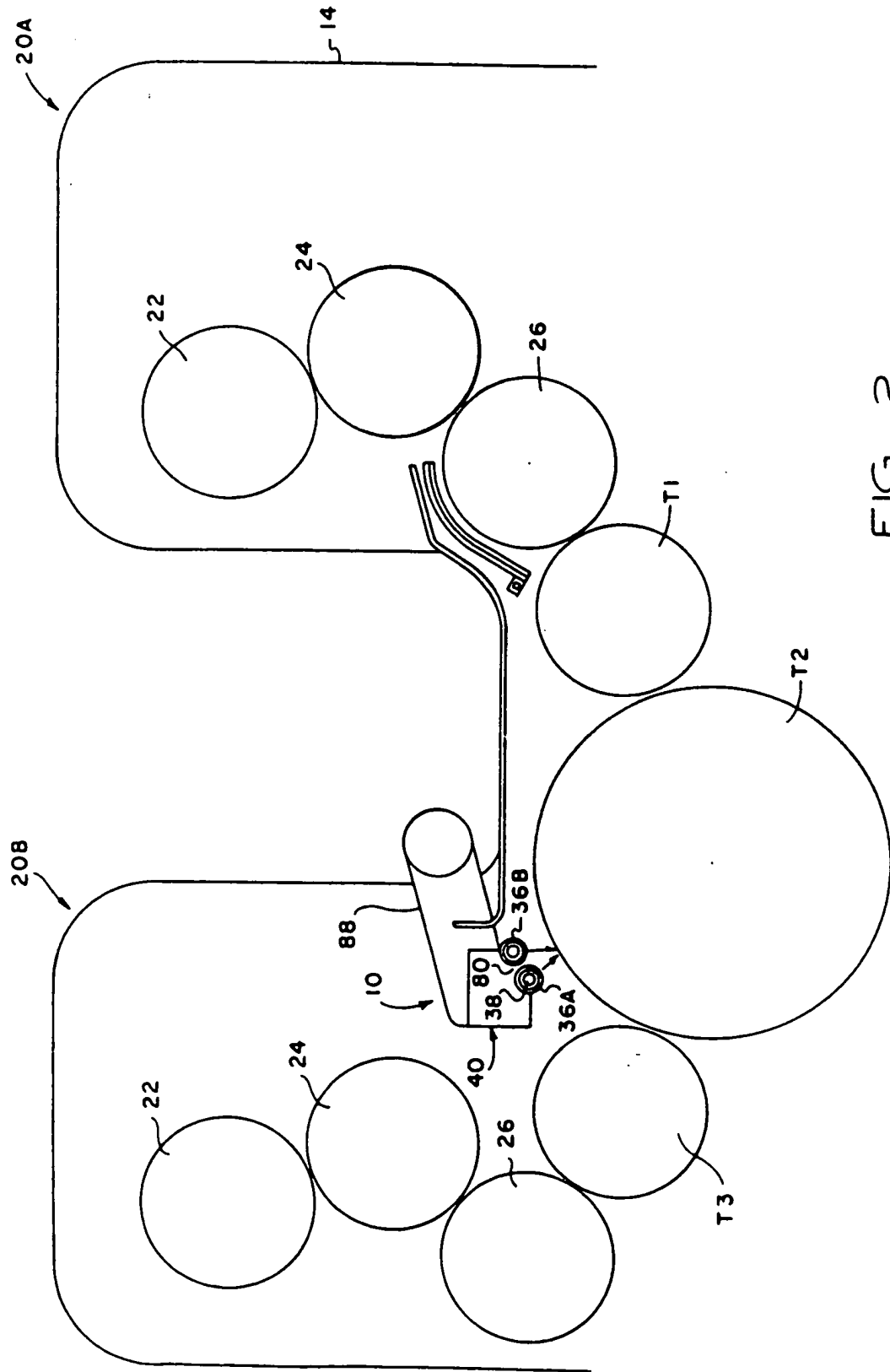


FIG. 2

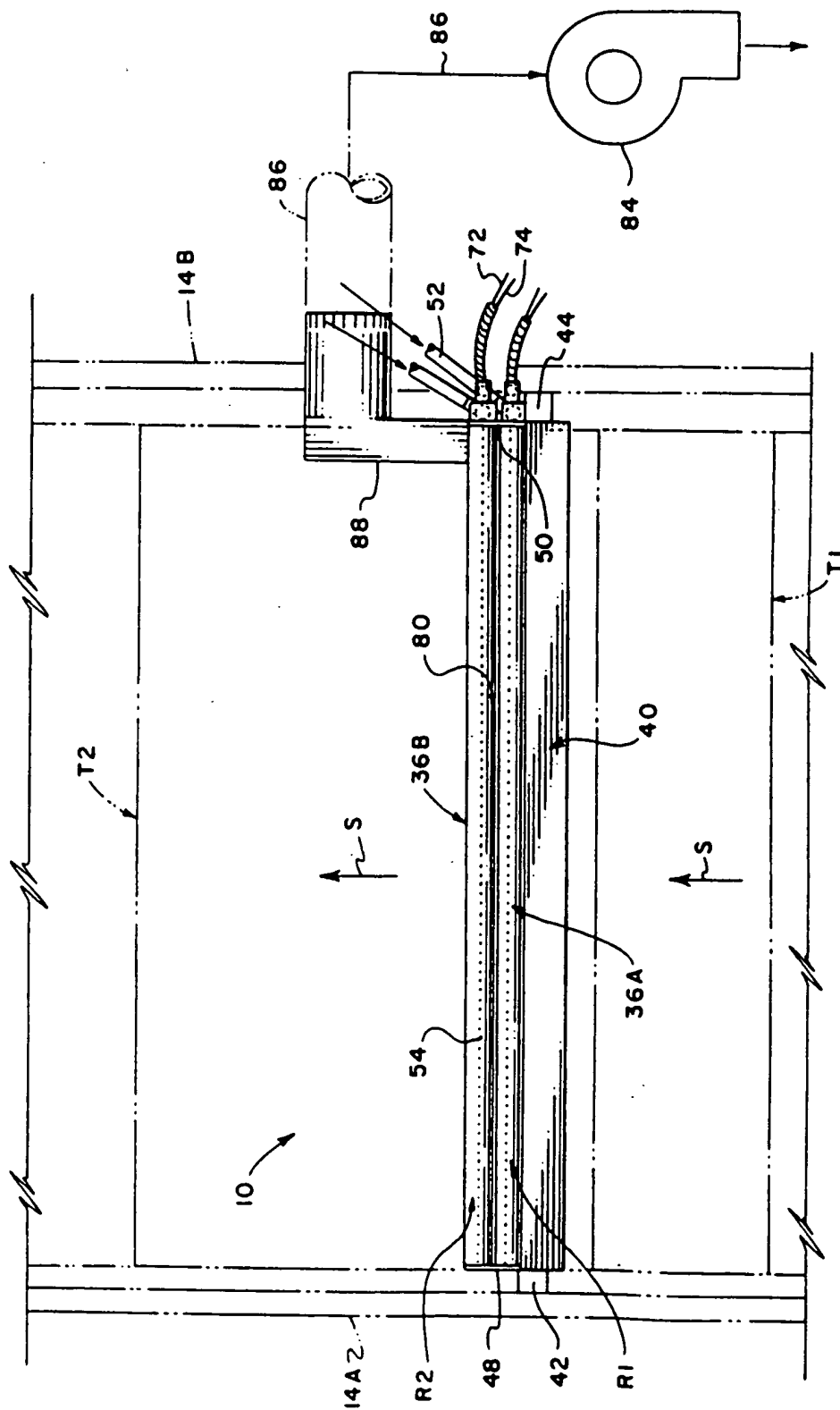


FIG. 3

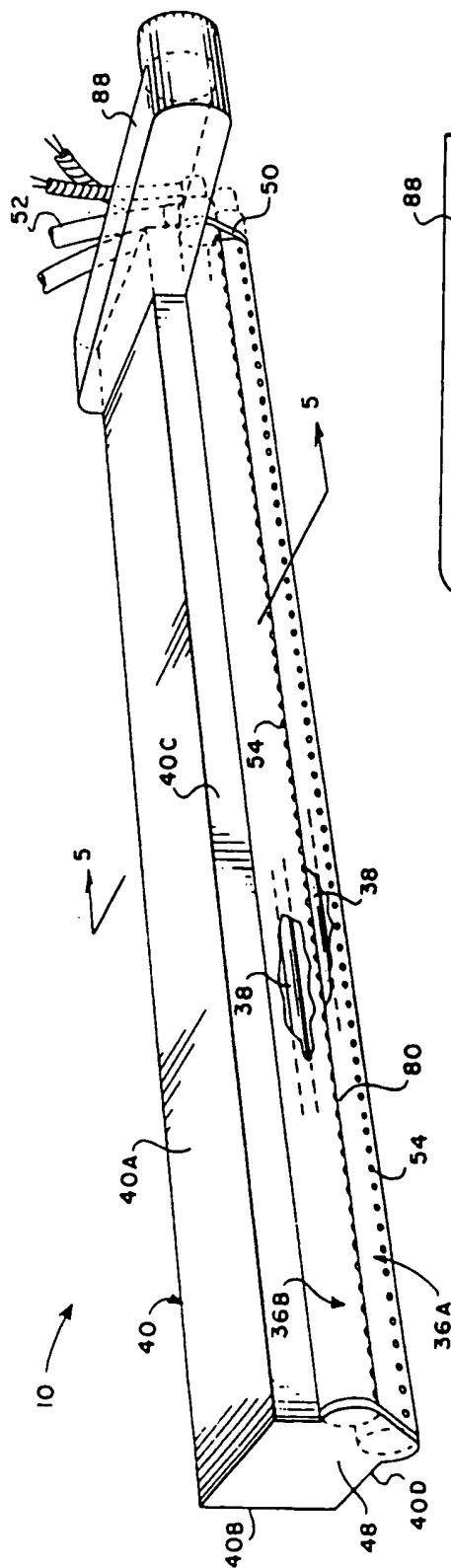


FIG. 4

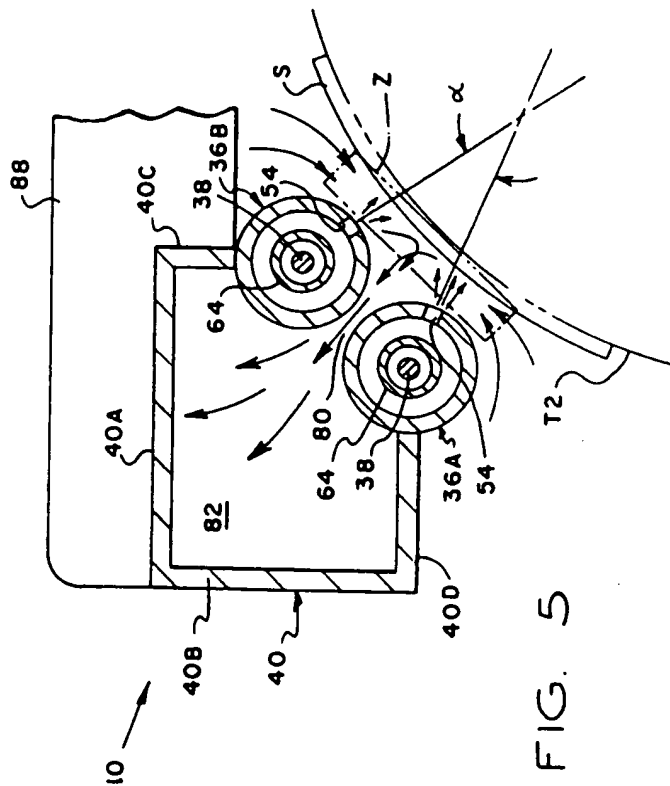


FIG. 5

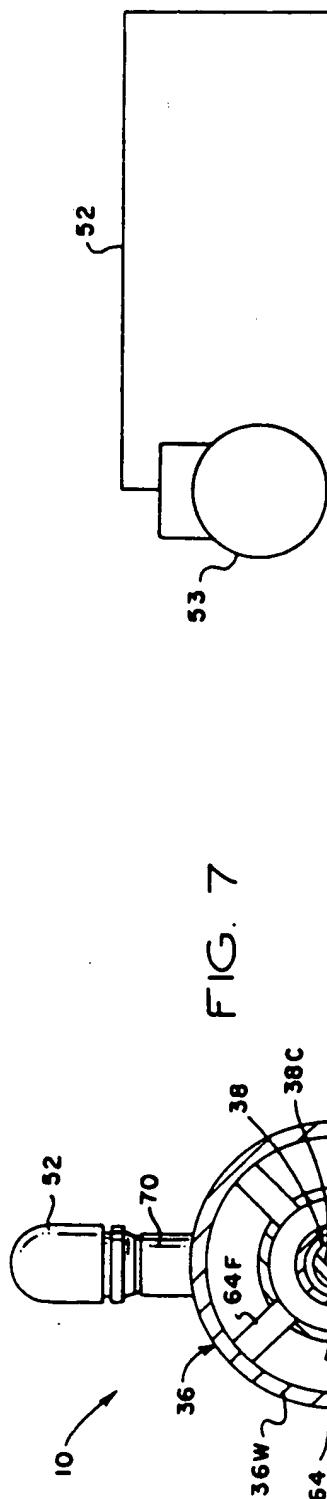
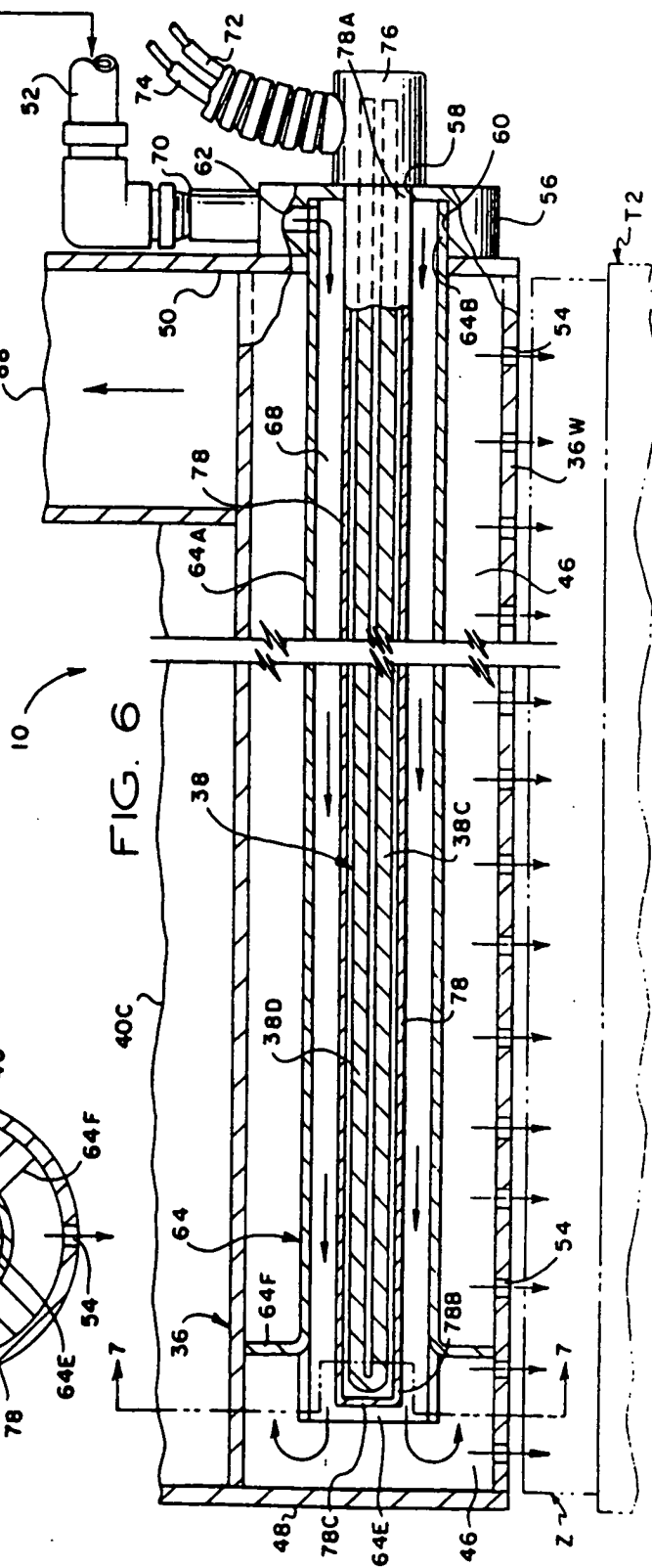


FIG. 6



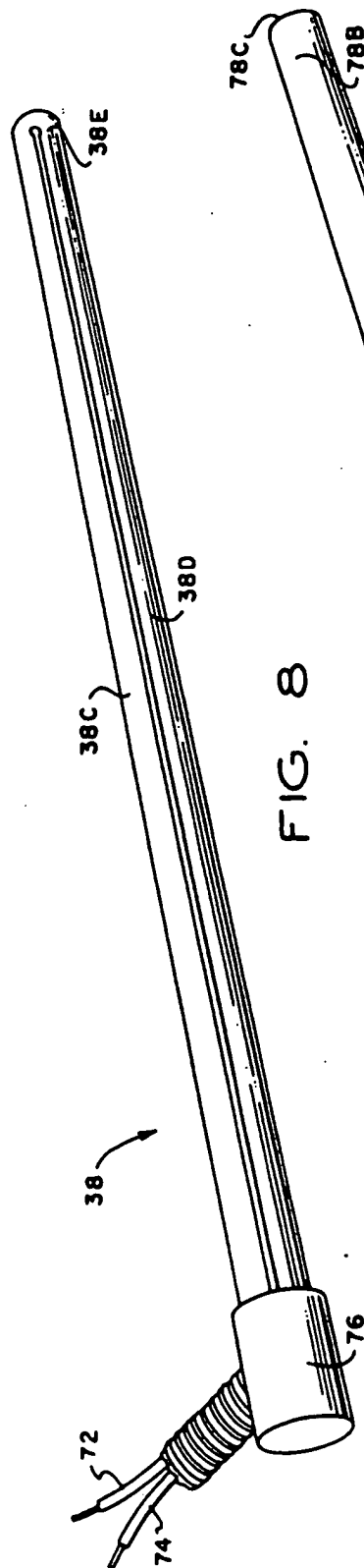


FIG. 8

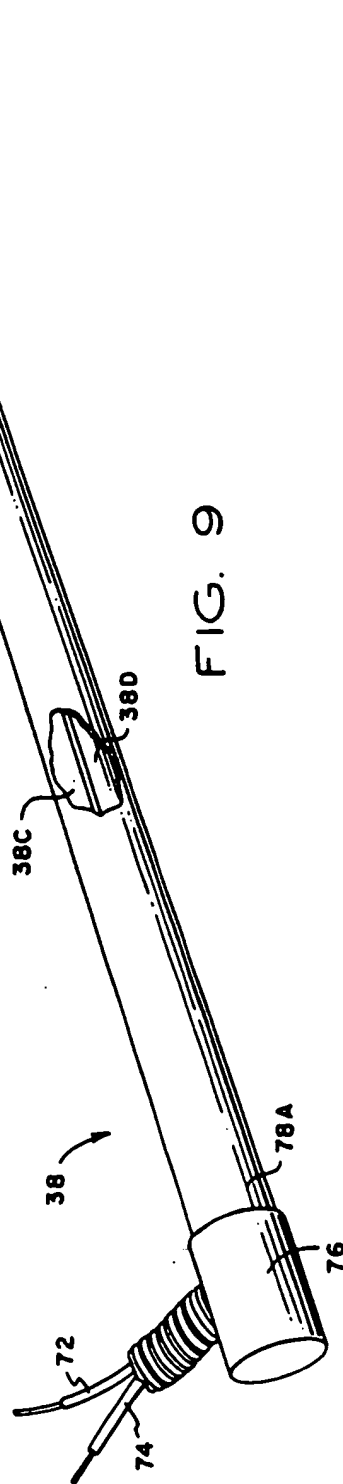


FIG. 9

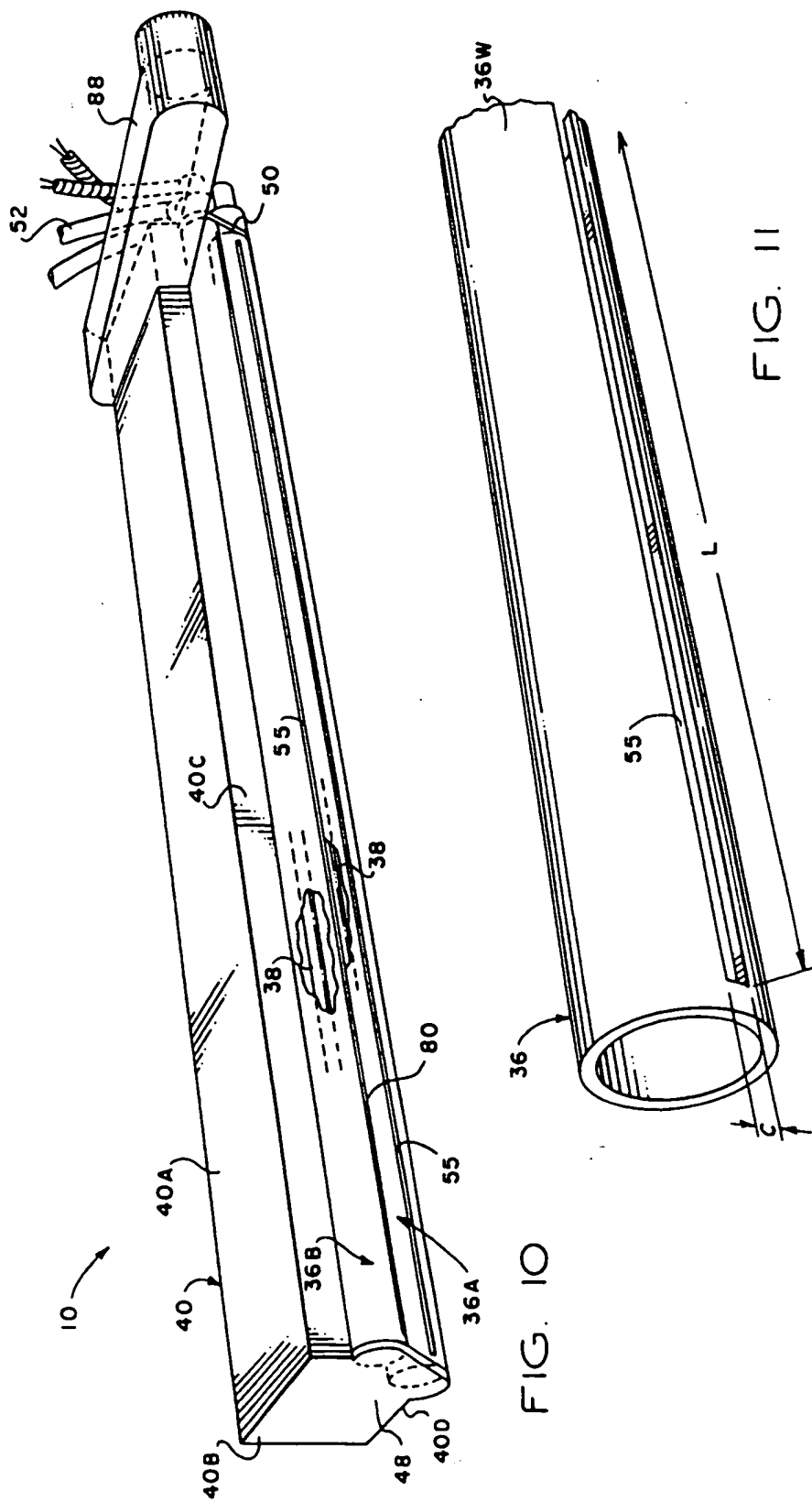


FIG. 11

FIG. 10



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EUROPEAN SEARCH REPORT

Application Number
EP 94 30 5812

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION
X	US-A-2 683 939 (MASTER APPLIANCE) * the whole document *	1-4, 6, 7, 10, 16, 17	B41F23/04 F26B21/00
Y	---	9, 12, 13, 19, 21, 23	
Y	FR-A-1 340 311 (ATELIERS ET CHANTIERS DE NANTES) * the whole document *	9, 13, 19, 21, 23	
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A	US-A-3 079 702 (JAMES HALLEY & SONS) ---		
A	WO-A-90 03888 (PLATSCH) -----		
			TECHNICAL FIELDS SEARCHED (Int. CL. 6)
			B41F F26B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 16 January 1995	Examiner Loncke, J
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DEUTSCHLAND



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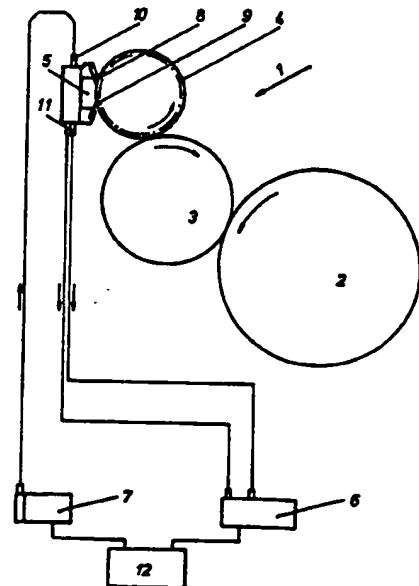
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Prüfungsantrag gem. § 44 PatG ist gestellt

54 Einrichtung zum Beschichten von Bedruckstoffen in Druckmaschinen

57 Die Erfindung betrifft eine Einrichtung zum Beschichten von Bedruckstoffen in Druckmaschinen zum Auftragen höherviskoser Flüssigkeiten auf Wasserbasis. Aufgabe der Erfindung ist es, eine dementsprechende Einrichtung für Druckmaschinen zu entwickeln, die eine Inlineverarbeitung von höherviskosen Flüssigkeiten mit einer Viskosität von etwa 0,1 bis 2 Pa s gestattet. Gelöst wird die Aufgabe dadurch, daß einem eine Hochdruckform tragenden Formzylinder (3) ein Druckzylinder (2) zugeordnet ist, eine Auftragwalze (4) mit Rasterstruktur dem Formzylinder (3) zugeordnet ist und gleichzeitig der Auftragwalze (4) ein Kammerrakel (5) zugeordnet ist. Das Kammerrakel (5) besteht aus einem positiven Rakel (8) und einem negativen Rakel (9) sowie Seitenteilen. Über eine Förderpumpe (7) wird höherviskose Flüssigkeit dem Kammerrakel (5) zugeführt, in dem Innenraum des Kammerrakels (5) wird ein Überdruck aufgebaut, die höherviskose Flüssigkeit fließt über Flüssigkeitsabläufe (11) ab und wird einer Saugpumpe (6) mit Reservoir (12) zugeführt.



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Die folgenden Angaben sind den vom Anmelder eingereichten Unterlagen entnommen
BUNDESDRUCKEREI 08. 94 408 041/292

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Beschreibung

Die Erfindung betrifft eine Einrichtung zum Beschichten von Bedruckstoffen in Druckmaschinen, speziell zum Auftragen von höherviskosen, wasserverdünnbaren, als effekt- und/oder Schutzlack wirkenden Schichten definierter Dicke auf den Bedruckstoff.

Aus der DE 30 46 257 C2 ist eine Einrichtung mit einem Lackvorratsbehälter und einer Schöpfwalze bekannt. Der durch die Schöpfwalze aufgenommene Lack wird dosiert einer Auftragwalze zugeführt. Zwei Rakelwalzen sind an die Schöpfwalze anstellbar und an die Dosierwalze ist ein Rakelblatt zum Abstreifen der Lackmenge anstellbar.

Ein Auftragswerk für hochviskose, ölhaltige oder niedrigviskose wasserlösliche Schichten ist aus der DE 39 06 648 A1 bekannt. Dieses Auftragswerk ist als Lackiereinrichtung, wahlweise als Offset-Hochdruck- oder Tiefdruckwerk ausgebildet. Die Ausführungen gehen von einer strukturierten Schöpfwalze aus, die mit einem Rakelblatt korrespondierend bzw. von einer Auftragwalze und einem strukturierten Formzylinder, der mit einem Rakelblatt korrespondiert. Das Hochdruckwerk besteht dabei aus einer mit Nöpfchen profilierten Schöpfwalze, der ein Rakelblatt zugeordnet ist, einer Übertragwalze, der Glättwalzen zugeordnet sind und einem Formzylinder mit Hochdruckform.

Gemäß der DE 34 27 898 C1 ist eine Vorrichtung zum Dosieren von Lack über einen zwischen zwei Walzen gebildeten Lackspalt bekannt.

Nachteilig bei diesen Lösungen ist es, daß bei Verarbeitung von Flüssigkeiten mit höherer Viskosität, ca. 0,1 bis 2 Pa·s Probleme auftreten, da die Flüssigkeiten eine Fließgrenze aufweisen. Es kommt zu Störungen der Flüssigkeitsströmungen, die z. B. zu sogenannten Lacknestern führen, in denen der Lack leicht antrocknet.

Beispielsweise aus der DE 36 14 582 A1 ist ein sogenanntes Kammerrakel zum Auftragen einer Beschichtungsmasse auf eine Beschichtungswalze bekannt. Mindestens zwei, an einer Walze anliegende, Rakelblätter bilden eine Kammer zur Aufnahme einer Masse, die unter Druck zugeführt wird.

Nachteilig ist, daß die unter Druck zugeführte Masse lediglich über dem Rakelspalt austreten kann und über einen weiteren druckfreien Raum eine Rückführung des Überschusses erfolgt. Bei Verwendung von höherviskosen Flüssigkeiten können sich an den Rakelblättern Ablagerungen aufbauen, die zu Druckstörungen führen.

Aufgabe der Erfindung ist es, eine Beschichtungseinrichtung für Druckmaschinen zu entwickeln, die eine problemlose Inline-Verarbeitung von schnellverdunstenden Flüssigkeiten mit einer Viskosität von etwa 0,1 bis 2 Pa·s und speziellen Zusammensetzungen mit hohem Pigmentanteil bzw. groben Pigmenten gestattet.

Gelöst wird die Aufgabe durch den kennzeichnenden Teil des Hauptanspruchs. Weiterbildungen ergeben sich aus den Unteransprüchen.

Die erfindungsgemäße Lösung gestattet es, das Inline-Beschichten mit höherviskosen Flüssigkeiten in einer Druckmaschine vorzunehmen unter besonderer Berücksichtigung von Lacken bzw. pigmentierten Farben auf Wasserbasis (Metallglanzdrucke). Einsatzgebiete bestehen für ausgespartes Lackieren (Spotlackierung) oder vollflächiges Lackieren. Aufgrund der geschlossenen Kammer beim Kammerrakel wird die Verdunstung der verwendeten Flüssigkeit reduziert. Dadurch wird die Verarbeitung von schnell verdunstenden, z. B. wasserlöslichen Flüssigkeiten verbessert. Die Kammerrakel

verhindert weiterhin das von offenen Rakelblattaussführungen bzw. Schöpfwalzenausführungen bekannte Lack- bzw. Farbspritzen. Ebenso wird das mögliche Aufbauen von angetrockneten Lack-/Farbresten an der Rakelschneide verhindert. Durch das geschlossene Flüssigkeitstransportsystem stellt die erfindungsgemäße Einrichtung einen Funktionsbaustein dar. Neben Kombinationen von mindestens einem Offsetdruckwerk und mindestens einem Flexodruckwerk kann diesen Einrichtungen eine weitere Lackiereinrichtung, z. B. zum vollflächigen Lackieren, nachgeordnet sein.

Die Erfindung soll an einem Ausführungsbeispiel näher erläutert werden. Dabei zeigt

Fig. 1 die schematische Darstellung einer Einrichtung zum Beschichten.

Die in Reihenbauweise ausgeführte Druckmaschine besteht aus fünf Offsetdruckwerken, einer Beschichtungseinrichtung 1 und einer nachgeordneten herkömmlichen Lackiereinheit. Dabei kann die Beschichtungseinrichtung 1 als Spotlackiereinrichtung (für ausgespartes Lackieren) und die nachgeordnete Lackiereinheit zum vollflächigen Oberflächenfinishing eingesetzt werden.

Die erfindungsgemäße Beschichtungseinrichtung 1 besteht aus einem Druckzylinder 2, dem bogenführende Zylinder (nicht gezeigt) vor- bzw. nachgeordnet sind. Der Druckzylinder 2 ist in Kontakt mit einem Formzylinder 3, der eine eingespannte flexible Hochdruckplatte trägt. In Kontakt mit dem Formzylinder 3 ist eine, als Lackwalze wirkende Auftragwalze 4, die eine strukturierte Oberfläche mit Rasternöpfchen besitzt. An die Auftragwalze 4 anstellbar ist dieser ein Kammerrakel 5 zugeordnet, welches ein positives Rakel 8 und ein negatives Rakel 9 und abschließende Seitenteile besitzt, so daß zur Auftragwalze 4 eine offene Kammer gebildet wird. Das positive Rakel 8 zeigt in Drehrichtung der Auftragwalze 4 und wirkt als Schließrakel. Das negative Rakel 9 zeigt entgegen der Drehrichtung der Auftragwalze 4 und wirkt als Arbeitsrakel. Das Kammerrakel 5 besitzt an seinem Gehäuse einen oberhalb einspeisenden Flüssigkeitszulauf 10, der mittig angeordnet ist. Am Gehäuseunterteil des Kammerrakels 5 sind zwei austretende Flüssigkeitsabläufe 11 im Bereich der Seitenteile angeordnet. Der Flüssigkeitszulauf 10 ist mit einer Förderpumpe 7 und einer Leitung gekoppelt. Die Flüssigkeitsabläufe 11 führen über Leitungen zu einer Saugpumpe 6. Eine speziell durch die Pigmentierung höherviskose Flüssigkeit z. B. auf Wasserbasis, wie z. B. Gold- und Silberdruckfarbe, Deckweiß oder Lack, wird durch die Förderpumpe 7 über eine Leitung und den Flüssigkeitszulauf 10 in die Gehäusekammer der Kammerrakel 4 gefördert. Der Förderdruck der Pumpe 7 bildet im Inneren des Kammerrakels 5 einen Überdruck aus, aufgrund dessen die höherviskose Flüssigkeit das Innere des Kammerrakels 5 in Richtung Auftragwalze und durch die Flüssigkeitsabläufe 11 verlassen soll. Von den Abläufen 11 wird die Flüssigkeit durch die Saugpumpe 6 in ein Reservoir 12 zurückgeführt. Über die Rasternöpfchen der Auftragwalze 4 wird die höherviskose Flüssigkeit von der als Lackwalze wirkenden Auftragwalze 4 zum Einfärben der Hochdruckform auf den Formzylinder 3 transportiert und wird als Schicht auf den vom Druckzylinder 2 zugeführten Bedruckstoff aufgebracht. Während des von der Auftragwalze 4 bewirkten Flüssigkeitstransports rakelt das negative Rakel 9 die Flüssigkeit von den Stegen der Rasternöpfchenstruktur der Auftragwalze 4 ab, so daß die Flüssigkeit ausschließlich in den Rasternöpfchen verbleibt.

Bezugszeichenliste

1 Einrichtung	
2 Druckzylinder	
3 Formzylinder	
4 Auftragwalze	5
5 Kammerrakel	
6 Saugpumpe	
7 Förderpumpe	
8 positives Rakel	10
9 negatives Rakel	
10 Flüssigkeitszulauf	
11 Flüssigkeitsablauf	
12 Reservoir	15

Patentansprüche

1. Einrichtung vorzugsweise in Bogenrotationsdruckmaschinen für mehrfarbigen Offsetdruck zum Beschichten von Bedruckstoffen mit wenigstens einem Lackierwerk, dadurch gekennzeichnet, daß wenigstens ein Beschichtungswerk als Flexodruckwerk ausgebildet ist.
2. Einrichtung nach Anspruch 1, dadurch gekennzeichnet, daß dem Flexodruckwerk ein konventionelles Lackierwerk direkt oder indirekt nachgeordnet ist.
3. Einrichtung nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß im Flexodruckwerk als Rakel-einrichtung ein Kammerrakel vorgesehen ist.
4. Einrichtung nach Anspruch 1 und 2, dadurch gekennzeichnet, daß das Flexodruckwerk aus folgenden Elementen besteht:
einem, eine Hochdruckform tragenden Formzylinder (3), der mit einem Druckzylinder (2) in Kontakt steht,
einer Auftragwalze (4) mit Rasterstruktur, die mit dem Formzylinder (3) in Kontakt steht und
einem Kammerrakel (5), dessen positives Rakel (8) in Drehrichtung der Auftragwalze (4) an diese angeordnet ist und dessen negatives Rakel (9) entgegen der Drehrichtung der Auftragwalze (4) an diese angeordnet ist, wobei eine Förderpumpe (7) Leitungssystemen mit Reservoir (12) vorgeordnet und eine Saugpumpe (6) Leitungssystemen mit Reservoir (12) dem Kammerrakel (5) nachgeordnet sind.
5. Einrichtung nach Anspruch 1, dadurch gekennzeichnet, daß das Kammerrakel (5) mit Leitungssystem, Förderpumpe (7) und Saugpumpe (6) ein geschlossenes System bilden, in dem zwischen Förderpumpe (7) und Saugpumpe (6) ein gemeinsames Reservoir (12) angeordnet ist.
6. Einrichtung nach Anspruch 1 und 2, dadurch gekennzeichnet, daß die Einrichtung (1) als Funktionsbaustein in einer Offsetdruckmaschine den Offsetdruckwerken vorgeordnet ist.
7. Einrichtung nach Anspruch 1 und 2, dadurch gekennzeichnet, daß die Einrichtung (1) als Funktionsbaustein in einer Offsetdruckmaschine zwischen den Offsetdruckwerken angeordnet ist.
8. Einrichtung nach Anspruch 1 und 2, dadurch gekennzeichnet, daß die Einrichtung (1) als Funktionsbaustein in einer Offsetdruckmaschine den Offsetdruckwerken nachgeordnet ist.

Hierzu 1 Seite(n) Zeichnungen

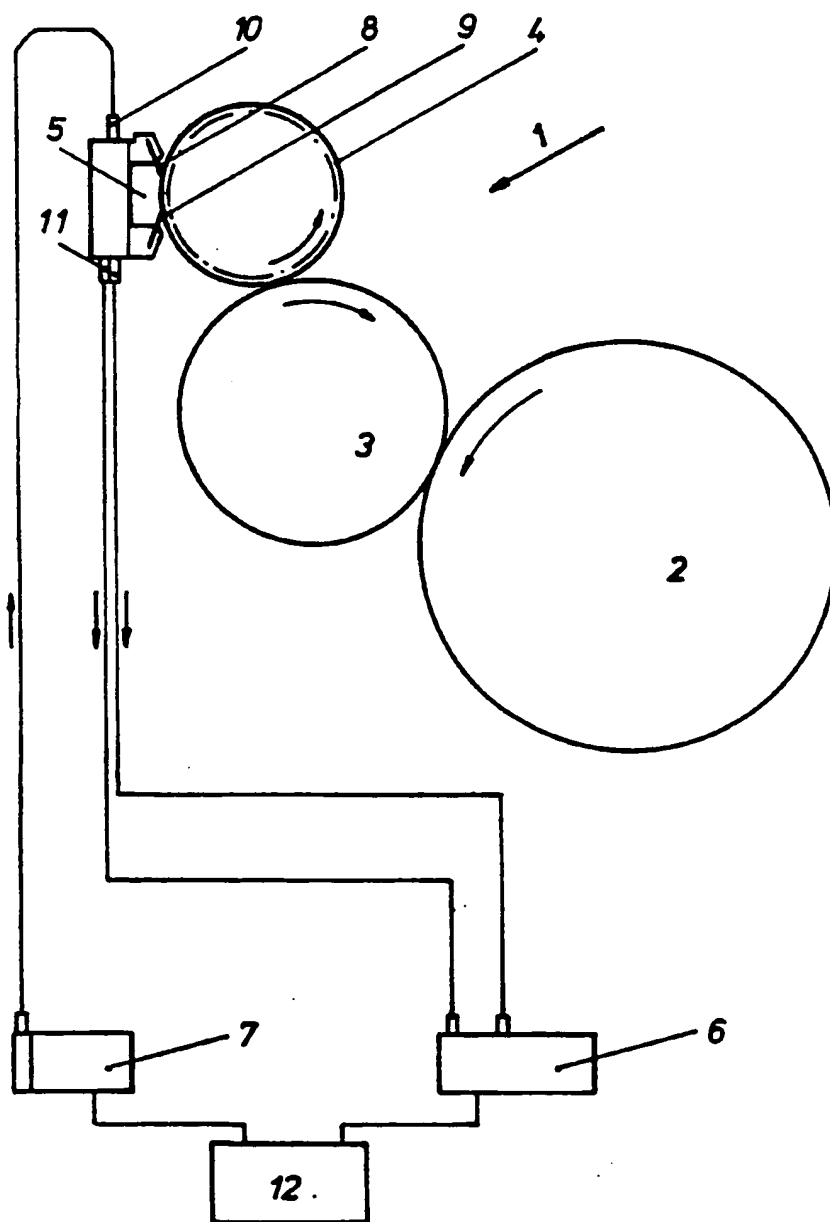


FIG.1

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